BUFFALO POUND WATER ADMINISTRATION BOARD

2009 annual report

CONTACT INFORMATION

The Buffalo Pound Water Treatment Plant is located approximately thirty kilometres northeast of the City of Moose Jaw, Saskatchewan, on Highway No. 301, seventeen kilometres north of the intersection with Highway No. 1.

The plant's mailing address is P.O. Box 1790, Regina, Saskatchewan, S4P 3C8.
The telephone number is 306-694-1377, fax 306-694-6050.

Plant management staff may be reached by email at the following addresses:

Ben Boots, Plant Superintendent: bboots@regina.ca
Dan Conrad, Assistant Superintendent / Chemist: dconrad@regina.ca
Gene Berezowski, Plant Foreman, gberezowski@sasktel.net.

The City of Regina maintains a web site containing information about the Buffalo Pound Water Treatment Plant. This may be accessed by going to http://regina.ca and then navigating to "Programs and Services" and then to "Water Treatment."

Information about the Buffalo Pound Water Treatment Plant is also available from the City of Moose Jaw's website http://www.moosejaw.ca/

BUFFALO POUND WATER ADMINISTRATION BOARD

2009 annual report

City of Regina | REGINA
Infinite Horizons

Moose Jaw
SURPRISINGLY UNEXPECTED

2009 annual report

BUFFALO POUND WATER TREATMENT PLANT
ANNUAL REPORT - 2009

Board Chairperson's Letter	5
Introduction	7
Mission and Goals	8
Resources	9
Plant Operations and Maintenance	11
Research and Analytical Programs	15
Budget	17
Appendices	19

Appendix 1	Water Quality Data - 2009
Appendix 2	Audited Financial Statements - 2009

BOARD CHAIRPERSON'S LETTER

On behalf of the management and staff of the Buffalo Pound Water Treatment Plant I am pleased to present this 2009 Annual Report of the Buffalo Pound Water Administration Board.

The Buffalo Pound Water Treatment Plant is critical to the health and economic development of the citizens of Moose Jaw and Regina. The original plant is over 50 years old and the most recent expansion occurred in 1988. With the plant's newest process equipment more than 20 years of age the Cities committed to make additional investments providing modern water treatment processes and renewing the plant infrastructure. These improvements will ensure the supply of high quality water from the Buffalo Pound Water Treatment Plant in the future.

The Board and plant management, in 2009, made significant advancements addressing retention and recruitment issues. Ensuring the plant is staffed by qualified and certified staff is paramount to supplying safe water to the Cities of Regina and Moose Jaw.

Ryan Johnson, M.A.Sc., P.Eng.
Chairperson
Buffalo Pound Water Administration Board

BUFFALO POUND WATER ADMINISTRATION BOARD
2009 ANNUAL REPORT

INTRODUCTION

This report summarizes the activities and major events at the Buffalo Pound Water Treatment Plant during 2009. The report outlines the Mission and Goals, achievements and areas of concern. It is intended as an information source for city administration personnel, elected officials and the general public. This report also contains the Drinking Water Quality and Compliance Report required by provincial regulations.

BUFFALO POUND WATER ADMINISTRATION BOARD

The Buffalo Pound Water Administration Board was created by an official agreement between the City of Regina and the City of Moose Jaw. The Board has historically been composed of two senior members of the City of Regina administration and one senior member of the City of Moose Jaw administration.

BOARD MEMBERS

Mr. R. Johnson, M.A.Sc., P.Eng. Chairperson
City Engineer
City of Moose Jaw

Mr. D. Richardson, B. Admin. CMA
Manager; Financial Services
Public Works / Planning & Development
City of Regina

Mr. D. Bellows, P.Eng.
Director of Environmental Services
Public Works Division
City of Regina

WATER TREATMENT PLANT MANAGEMENT

Mr. B. Boots, FEC, P.Eng.	Plant Superintendent
Mr. D. Conrad, P.Chem.	Assistant Superintendent / Plant Chemist
Mr. E. Berezowski	Plant Foreman

MISSION AND GOALS

MISSION

* To provide for the cities of Regina and Moose Jaw a reliable and affordable supply of safe, high-quality drinking water which meets the needs and expectations of consumers.

GOALS

* Treated water that meets the quality expectations of the citizens of Moose Jaw and Regina, and meets or exceeds all government regulated parameters.

* Operational practices and controls that ensure a continuous and safely-treated supply of water within an environmentally-responsible and cost-efficient operation.

* Judicious monitoring of the treated water from the plant to the end of the cities' distribution systems. Appropriate monitoring of the water in Buffalo Pound Lake, the Upper Qu'Appelle River and Lake Diefenbaker to identify long-term trends and areas of concern to protect the water supply.

* Water quality research to identify possible chemical and microbiological contaminants as well as to test and implement the best available treatment technologies, thus ensuring that the water treatment plant can meet current and future expectations for regulated parameters.

RESOURCES

WATER SOURCE

Water for Regina and Moose Jaw is taken from Buffalo Pound Lake, a shallow reservoir in the Qu'Appelle Valley. The lake is 29 km long, 1 km wide but has an average depth of only 3 metres. The surface area of Buffalo Pound Lake is 2900 hectares inferring it has a capacity of 90 million cubic metres at the "full supply level" of 509.3 metres above sea level. Water levels in Buffalo Pound Lake are controlled by the Saskatchewan Watershed Authority and maintained by the release of water from the Qu'Appelle Dam on Lake Diefenbaker. Mean annual water releases of 5 to 1 cubic metres per second are typical. Thus the average residence time of water in the lake varies from six to thirty months. Very little water enters Buffalo Pound Lake from rain or spring runoff except in abnormally wet years. The principal source of the water is rain and snow-melt in the mountains of Alberta, collected by various tributaries draining to the South Saskatchewan River and stored in Lake Diefenbaker. As such, the water is potentially affected by discharges from point sources (upstream cities) and non-point sources (agricultural and recreational).

Buffalo Pound Lake is generally free of industrial pollution but is naturally rich in nutrients (phosphate, nitrogen and dissolved organic carbon) which encourage the growth of phytoplankton (typically diatoms in the winter and green algae or cyanobacteria in the summer). Weed growth can also be extensive. Algae and weeds pose many treatment challenges such as high chemical demands and undesirable tastes or odours. The lake and watershed appear to also be impacted by ground waters infusing minerals.

PLANT TREATMENT

Raw water from Buffalo Pound Lake passes through a series of treatment stages designed to remove impurities such as algae, bacteria, clay particles and dissolved organic materials. The objective of this treatment is to produce water that is clear, colourless, odour-free, aesthetically pleasing and safe to drink.

The treatment process consists of six stages: chlorination, cascade de-gasification, coagulation flocculation, clarification, filtration and carbon adsorption.

Lake water enters a pumping station located on the south shore of Buffalo Pound Lake through two submerged intakes. Raw water is chlorinated and then pumped to the treatment plant via two pipelines connecting the pumping station to the main treatment plant. The pipelines are 1.05 and 1.35 metres in diameter, extend a distance of 3000 metres and rise 82 metres. After reaching the plant, water is initially divided into two streams, each of which has cascade de-gasification, coagulation/flocculation and clarification. The streams are then recombined for the final stages of treatment, including filtration, carbon adsorption and further chlorination.

Cascade operation is normally used during periods of excessive dissolved gas levels in the raw lake water. Excessive dissolved gases are most commonly produced by photosynthetic bacteria and algae. During cascade de-gasification, the water falls over a series of steps which releases excess dissolved gasses and prevents the formation of gas bubbles in later treatment processes. Clarification and filtration processes could be impeded by gas bubbles that attach to particles of floc, causing them to float, rather than sink, and by causing air binding in the filters.

If conditions warrant, powdered activated carbon (PAC) is added to reduce taste and odour. The use of powdered activated carbon while relatively infrequent is occasionally necessary when granular activated carbon contactors are off line or to temporarily reduce the odour loading when the contactors are on-line.

Coagulation and flocculation are the next steps in treatment. Aluminium sulphate (alum) is vigorously mixed with the water. In the process of coagulation, the alum neutralizes surface charges on particulate matter contained in the water and forms a fluffy precipitate (floc) that entraps suspended algae and clay particles. The water is then stirred slowly in flocculation tanks to allow floc particles to become larger and denser prior to their removal.

The floc-bearing water then flows through clarifiers, where most (more than 95%) of the floc with its entrapped impurities is allowed to settle by gravity to the bottom while clear water is constantly removed from the top. Settled floc is

removed from the clarifiers as sludge and pumped to holding lagoons where it is further separated into clear water (returned to the lake) and solid sludge (removed for disposal).

Any floc that was not removed by clarification is separated in the filtration stage. Water is passed through mixed-media filters consisting of a top layer of coarse anthracite followed by successive layers of fine silica sand, and even finer garnet sand. Any remaining particulate matter or floc is trapped by the filters. Filters are cleaned by backwashing with clean water. The filtration step completes the removal of particulate impurities. The removal of dissolved organic impurities, which are responsible for taste and odour, is accomplished next in the carbon adsorption stage of treatment. Large rectangular tanks (contactors) contain granular activated carbon (GAC) to a depth of 3 metres. Water is lifted by Archimedes screw pumps from the bottom of the filters and taken to the top of the contactors where it is allowed to flow by gravity down through the GAC. GAC contains many microscopic pores which adsorb dissolved chemical impurities. Water is in contact with the GAC for 15 to 30 minutes, depending on flow rates, and emerges freed of the dissolved organic materials which cause objectionable taste and odour. The GAC filtration process at Buffalo Pound was designed for taste and odour removal and is used during periods of poor taste and odour in the raw water; the normal period of operation is from May until December.

All stages of water treatment are now essentially complete. Prior to delivery by pipeline to the consumers, chlorine levels are adjusted, if necessary, to provide adequate disinfection and to counteract any possible contamination encountered during its travel to the cities' reservoir and distribution systems. Water delivered to the City of Moose Jaw is also fluoridated prior to pumping.

The carbon used in the contactors retains its effectiveness for taste and odour improvement up to six months, after which time it must be regenerated or replaced. GAC is a relatively expensive treatment component and it has been found to be cost effective as well as environmentally responsible to regenerate the used GAC rather than to discard it and purchase new. Regeneration is accomplished by heating the spent GAC to 850° C in an oxygen-free atmosphere contained in a fluidized bed gas-fired furnace. Spent GAC is transferred by pipeline in a slurry from the contactors to the furnace, regenerated to original specifications, and returned to the contactors for reuse. Carbon regeneration is usually performed at Buffalo Pound from mid-October to mid-April.

ENVIRONMENTAL PROTECTION AND CONSERVATION

The Buffalo Pound Water Treatment Plant, like any large industrial facility, has the potential to affect the environment. The plant has facilities in place to handle all process wastes including alum sludge, off gases from the carbon regeneration facility, laboratory wastes, various solid wastes generated by plant operations, and sewage. The plant uses a considerable quantity of electrical energy in its operation; conservation efforts give returns in the form of reduced demands on the environment and lower operating costs.

A series of sludge lagoons is used in the treatment of the alum sludge waste stream. This form of sludge management can be very effective in ensuring that the sludge is retained. However, the plant's lagoons were identified as being undersized in the 2005 Water Works System Assessment. Sludge is exposed to a natural freeze-thaw cycle that dewaters it to produce a nearly dry granular material which is transported to a landfill site. This material contains some plant nutrients, namely nitrogen and phosphorous which could make it suitable for land-spreading. Land-spreading the sludge allows the water treatment plant to safely dispose of a waste product while simultaneously adding nutrients to the soil. Buffalo Pound is one of the few water treatment plants in Canada with the ability to manage waste sludge in this manner.

The natural gas-fired furnace in the carbon regeneration facility produces off gases which are thoroughly scrubbed before release to the atmosphere.

Waste disposal agencies are contracted to handle laboratory wastes and solid wastes generated by the plant. As it becomes necessary, firms specializing in hazardous waste disposal are contracted to dispose of chemical wastes.

Sewage generated by the plant is pumped to treatment and evaporation lagoons located on plant property. The primary lagoon has a geotextile fabric and bentonitic clay liner to prevent seepage.

Efforts are continually made to utilize electrical energy in the most efficient fashion possible. The biggest consumers of power are the large pumps located at the lake pumping station and the units that pump water to the cities. Pump usage is scheduled to minimize power usage during high electrical demand times and to make up the required volumes during low demand times. This results in lower energy costs and less environmental damage associated with power generation.

WATER QUALITY MONITORING

A well-equipped accredited laboratory is located on site and used to monitor the quality of raw and treated water as well as water quality at several intermediate steps in the treatment process. Major process control parameters (turbidity, pH, chlorine residual, particle counts, dissolved oxygen and temperature) are monitored continuously by instrumentation communicating with the plant process computer system. Analyses are performed for most regulated parameters on a daily to monthly schedule; for other parameters (most trace-level organics and metals) samples are sent to commercial laboratories. Analytical results are compared to Canadian Federal guidelines and to Saskatchewan Environment (SE) objectives. All criteria for safe drinking water were satisfied by the Buffalo Pound Water Treatment Plant in 2009.

Analyses for a wide variety of physical, chemical, and microbiological parameters are performed in the Buffalo Pound Laboratory. Some 65 different constituents are routinely determined and approximately 25,000 tests are done yearly. The 2009 results are summarized in Appendix 1, together with results for metals and organics obtained from commercial laboratories.

The quality of the regenerated granular activated carbon is monitored by plant staff for a variety of physical and chemical parameters.

A vigorous in-house quality control program is maintained to ensure data generated by the Buffalo Pound Water Treatment Plant Laboratory is valid. The laboratory is accredited by the Canadian Association for Laboratory Accreditation (CALA) for 31 different chemical and bacteriological parameters.

PLANT OPERATIONS AND MAINTENANCE

WATER PRODUCTION

Water Production and sales (in megaliters) were as shown in Table 1. (See also related Graphs 1 and 2.) Total sales to the cities in 2009 were 27,556 ML to Regina and 5996 ML to Moose Jaw. Sales to Regina decreased 1.1% from 2008, and sales to Moose Jaw decreased 9.6%.

Sales to the SaskWater Corporation in 2009 decreased by 10.3 ML, or 5.3%, to 184.9 ML from 2008 values. Sales to SaskWater represent less than one percent of the plant's production. It is worthwhile to note that the total amount of water sold to the SaskWater Corporation in all of 2009 is equivalent to 30 hours of combined sales to Regina and Moose Jaw in July.

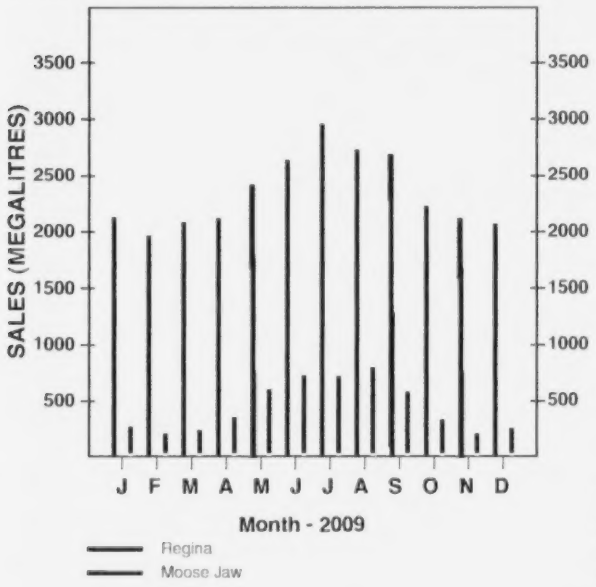
Graph 3 shows annual water production by year since the plant began operation in 1955.

Table 1: 2009 WATER SALES (MEGALITRES)
BUFFALO POUND WATER TREATMENT PLANT

MONTH	REGINA	MOOSE JAW	SASK WATER CORP.
January	2092.9	447.1	11.9
February	1878.3	411.4	11.7
March	2130.5	441.6	13.5
April	2054.7	420.3	13.1
May	2301.6	544.8	19.5
June	2684.9	657.5	22.1
July	2925.8	640.7	21.8
August	2686.8	651.2	18.3
September	2598.3	588.6	15.0
October	2108.6	422.0	12.2
November	2049.4	380.5	12.5
December	2044.3	390.5	13.2
Totals	**27556.1**	**5996.2**	**184.9**

Graph 1

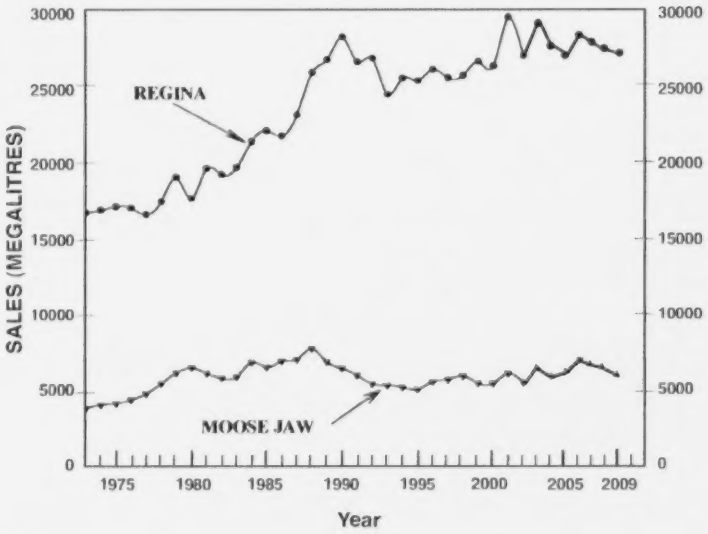
BUFFALO POUND WATER TREATMENT PLANT
MONTHLY SALES TO REGINA & MOOSE JAW - 2009



TOTALS
Regina **27556.1** Moose Jaw **5996.2**

Graph 2

BUFFALO POUND WATER TREATMENT PLANT
ANNUAL SALES TO REGINA & MOOSE JAW
1977 - 2009



Graph 3

BUFFALO POUND WATER TREATMENT PLANT
ANNUAL RAW WATER CONSUMPTION
1955 - 2009

PLANT OPERATIONS

The processes employed at the Buffalo Pound Water Treatment Plant are modified during the year as determined by the water quality in Buffalo Pound Lake.

Ice cleared the lake on May 1, 11 days later than normal. Chemical dosages were generally low throughout 2009. The granular activated contactors were in operation from May 25 to November 20. The cascades were used intermittently through to December 10.

In the fall of 2009 the lake froze over November 23.

CARBON REGENERATION FACILITY

The carbon is regenerated in the winter so that it can be used to remove taste and odour from the water in the following summer. The 2008 / 2009 regeneration season was from October 27, 2008 to March 6, 2009. The regeneration system commenced October 13, 2009. Operation of the furnace was very smooth throughout the season.

MAINTENANCE AND CAPITAL PROJECTS

Effective maintenance plays a key role in keeping the water treatment plant running efficiently producing high quality water. All vessels are drained, cleaned and inspected at least annually. All critical plant equipment is inspected, tested and maintained at least annually to help ensure satisfactory operation during peak flow demands. All water quality monitoring instruments are checked or calibrated frequently. The results from major on-line instruments are compared to laboratory instruments several times per day.

Several projects were completed with funds from the Capital Replacement Reserve for a total cost of $392,909. One major project was a complete refurbishing of the plant's washrooms and lunchroom; another was replacement of the filter valves on the original eight mixed-media filters. Additional progress was made on the project updating the process and instrumentation drawings. The Capital Replacement Reserve funded the replacement of an atomic adsorption spectrophotometer in the laboratory.

In addition to the projects funded by the Capital Replacement Reserve other projects were completed. A shaft in LPS pump "C" (85 ML/d) broke in 2008; the replacement shaft unfortunately failed again but the repair accomplished in 2009 was successful.

Special ladders to improve safety accessing the granular activated carbon contactors were installed in several vessels; unfortunately aggressive erosion / corrosion reduced the expected lifespan of the ladders. Metallurgical Consulting Services Ltd. of Saskatoon was retained to address the problem of widespread corrosion of aluminum or aluminum alloys in the plant treated water. Replacement ladders will be made of fiberglass.

The 480 volt electrical supply cables to the carbon regeneration plant failed in April. When the old cables were pulled from the conduit dirt and grit that was probably in the conduit since installation came out also. The conduit was cleaned prior to new cables being installed. An "Arc Flash Study" was performed on the plant's low and medium voltage switchgear. The study indicated that dangerous levels of arc energy would be experienced if a fault occurred at three switchgear locations. Operation of switchgear at these particular locations will only be done by our journeymen staff employing special provisions until the incident arch flash energy can be reduced with engineered modifications.

The GAC contactors need to have fines removed after annual regeneration to prepare them for the upcoming season. In 2009 a novel approach using a farm grain vacuum simplified this somewhat onerous manual labour job. The 750 mm Train A raw water mag meter was replaced. The motor from LPS Pump "B" was overhauled. When the motor was pulled it was noted that a weld had failed in the pump discharge head; the repair was made in a shop in Moose Jaw.

WASTEWATER FACILITY

The clarifier underflow removes particulate matter (alum sludge) from the raw water. The effluent stream is directed to alum sludge lagoons where the sludge is deposited and the clear water overflow returns to Buffalo Pound Lake. The sludge from the stockpile was taken to the Moose Jaw landfill. The sludge from the northwest and southwest summer lagoons was removed and stockpiled at the plant due to its wet condition.

REGULATORY AND GOVERNMENTAL AFFAIRS

In December 2002 the provincial government introduced new Water Regulations dealing with water and wastewater facilities. These comprehensive regulations are intended to improve water quality and reporting accountability. Saskatchewan Environment conducted two inspections of the

plant in 2009 on March 2 and August 6; no deficiencies were noted.

One requirement of the regulations is that the laboratory analytical work required by a water treatment plant's Permit to Operate must be done by an accredited laboratory. The Buffalo Pound laboratory fulfilled all requirements to maintain accreditation from the Canadian Association for Laboratory Accreditation (CALA). The laboratory participated in four sets of proficiency test analyses. Results were very good, demonstrating the capability of laboratory staff to produce accurate results.

The Water Regulations require that the plant submit results of the weekly bacteriological, monthly trihalomethane and quarterly major ion analyses promptly to Saskatchewan Environment and that a Drinking Water Quality and Compliance Report be published annually. The required Drinking Water Quality and Compliance Report is provided in the Appendix. The Buffalo Pound Water Treatment Plant met all sample submission requirements of the plant's operating permit. Saskatchewan Environment had earlier indicated that BDCM (one of the trihalomethanes) would not be regulated at the rather strict level originally promulgated as a Health Canada MAC (16 ug/l). Health Canada removed the MAC in 2009. The plant is in full compliance with the Water Regulations.

Plant operations are subject to the federal National Pollutant Release Inventory (NPRI) Legislation, Canadian Nuclear Safety Commission, as well as the Environmental Emergency Regulations. The required inventory submissions were made to the NPRI program. Radioactive substances are used in the laboratory's electron capture detectors. Swipe tests ensuring the integrity of these detectors were sent to Saskatchewan Labour for analysis; no leakage above the guidelines was detected.

HUMAN RESOURCES

In 2009 the Buffalo Pound Water Treatment Plant employed a total staff of 28, consisting of three managers, nine operating staff, five laboratory technologists, five journeyman maintenance persons, four maintenance persons, and two labourers. The plant's millwright resigned January 16; the internal posting was completed with no applicants meeting the required qualifications. In the 12 month period from February 1, 2008 to January 30, 2009 the plant had a need to hire three Laboratory Technologists, an Operator / Maintenance person and a Journeyman Millwright reflecting an unprecedented level of workforce change. In June the Board, plant management and the Communications, Energy and Paperworkers Union, Local 595 concluded negotiations to implement significant advancements addressing retention and recruitment issues. Union / management meetings were held to create an agreement in compliance with new provincial Essential Services legislation.

The Buffalo Pound Water Administration Board was presented with a Certificate of Achievement Award from the provincial Worker's Compensation Board for the plant's safety record. This is the twenty-second consecutive year the plant has been presented with this award. During 2009 there were no lost-time accidents or medical-aid case injuries.

Plant staff participates in the Regina Civic Employees Pension Plan; the plant superintendent attended many meetings to attempt to address the Pension Plan's large unfunded liabilities. The issue remains unresolved as of yearend.

WATERSHED PROTECTION

The Buffalo Pound Water Treatment Plant continues to be involved in consultation processes dealing with watershed protection in the Upper Qu'Appelle River and Buffalo Pound Lake. The Watershed Advisory Committee finalized the Upper Qu'Appelle River and Wascana Creek Watersheds Source Water Protection Plan. In June 2008, funding to assist with implementation of the Upper Qu'Appelle Source Water Protection Plan was presented from the Saskatchewan Watershed Authority to the implementation organization. The organization is known as WUQWATR (Wascana Upper Qu'Appelle Watersheds Association Taking Responsibility, Inc.) The plant superintendent attended the annual meeting of the Upper Qu'Appelle Watershed Advisory Committee March 24, 2009. At the WUQWATR meeting on July 21, staff from the Saskatchewan Watershed Authority and their consultant, AECOM, presented their findings with respect to channel improvements or constructing a separate channel south of the valley. The Saskatchewan Watershed Authority wants to plan for a flowrate of up to 25 cubic meters per second; more than three times the volume the current channel could handle. AECOM's conclusion, in their report to the Saskatchewan Watershed Authority, is that construction and operation of a channel out of the valley, on the south side of the river has similar life-cycle costs as rehabilitating the original constructed channel and protecting the 'natural' river from erosion.

MISCELLANEOUS

Six staff attended the annual Saskatchewan Water and Wastewater Association Annual Conference in November. One of the plant's senior operators made a presentation on turbidity at this conference.

The plant superintendent was invited to give a presentation on "Disinfection By-Products" at a CES – SaskWater technology conference in Saskatoon on January 20.

Meeting of the City of Regina Water Quality Emergency Response Plan Task Force were held in April and October.

The plant, in view of the H1N1 pandemic declared by the World Health Organization completed adequate "Pandemic Planning" to ensure stable operations.

The City of Regina and their engineering consultant completed a 2 year warranty inspection of the Regina supply pumps on April 8.

The Regina Train B flow meter was replaced when the Regina pumping system was down during the May 2009 pig-launch. The check valve on Moose Jaw pump "B" was repaired.

The provincial park hired a different engineering consultant to expedite the backflow preventer project on their supply pipeline. A new sales agreement which acknowledges the Park's backflow preventer and ancillary equipment was negotiated with the Province of Saskatchewan for the supply of water to Buffalo Pound Provincial Park.

The Buffalo Pound Water Administration Board initiated an "Organizational Assessment and Design Review" process with the assistance of a consultant facilitator.

RESEARCH AND ANALYTICAL PROGRAM

SUPPLEMENTAL MONITORING

In addition to process monitoring which is required under the terms of the operating permit issued by Saskatchewan Environment, the Buffalo Pound Water Administration Board undertakes supplementary monitoring as follows:

* Distribution System Monitoring for the City of Regina and Moose Jaw
* Buffalo Pound Lake Monitoring
* Upper Qu'Appelle/Lake Diefenbaker Monitoring

The distribution system monitoring program surveys twelve locations in Regina and five in Moose Jaw on a monthly basis. This data assists the cities in their operations and required monitoring. Laboratory resources are also used on an occasional basis to assist the cities in responding to complaints and other issues related to water quality.

Monitoring of Buffalo Pound Lake provides information on the quality of the raw water supply; this facilitates the operation of Plant processes. Considering this longer-term data base is invaluable in evaluating the health of our drinking water source. The eutrophic status of Buffalo Pound Lake and its production of algae blooms that challenge our water treatment processes are well known. The historical data base of lake water quality coupled with hydrological records has demonstrated that moderate inflows from Lake Diefenbaker released by the Qu'Appelle Dam are beneficial in reducing the residence time of water in Buffalo Pound Lake and so moderating the potential for algae blooms. Unfortunately, high water flows through the light alluvial soils of the Upper Qu'Appelle River promotes erosion and the transport of phosphorus, an essential nutrient for algae growth into Buffalo Pound Lake. Cyanobacteria often predominate in natural waters that are deficient in nitrogen as many of those species can "fix" atmospheric nitrogen. By limiting phosphorus, the growth advantage of cyanobacteria over the more benign green algae is reduced.

Monitoring of the Upper Qu'Appelle River / Lake Diefenbaker system provides a database of water quality information that may allow an assessment of long-term water quality trends. The plant's database is frequently requested by provincial agencies and university researchers.

HALOGEN SOURCES OF DISINFECTION BY-PRODUCTS

Chemical disinfectants can react with the naturally occurring compounds found in water and generate new compounds that might be of concern to human health. Some of these compounds contain bromine and iodine, which with chlorine are termed halogens, and may potentially be incorporated into disinfection by-products. Although the individual bromine and iodine by-products are not presently regulated, it is prudent to evaluate their potential for formation and identify their sources. Analyses of these halogens were performed by the Saskatchewan Research Council using ICP-MS (ion coupled plasma – mass spectroscopy) which provides results at the parts per billion level (0.000001 grams per litre).

Analyses of various process streams within the treatment plant demonstrated that the chlorine added to disinfect bacteria, viruses and some types of protozoa was responsible for only a portion of the additional bromine found.

Results from watershed sampling for halogens revealed that bromine levels were highest in Buffalo Pound Lake water. Bromine levels within the upper Qu'Appelle River were typically two or three times lower. This might be due to the infiltration of ground waters into the lake. Ground waters in the prairies are typically enriched in chlorides and bromides from their passage through glacial tills and from contact with marine Cretaceous bedrock. Surprisingly bromide (Br- which would be the form of bromine in ground waters) was detected at much lower levels than total bromine. This indicates that bromine is not found as a free anion but is in some other form, possibly incorporated into organic compounds. Algae are capable of forming organic bromine compounds as part of their cell metabolism which they use for various purposes. Abiotic (without life) processes may form organo-bromines as well. Understanding the source and fate of bromine and iodine in natural water will allow the planning of processes to remove or modify them should that be necessary in the future.

PERSONAL CARE PRODUCTS AND PHARMACEUTICALS IN BUFFALO POUND LAKE

We all use various pharmaceuticals and chemicals in our everyday lives. These chemicals and their metabolites eventually find their way into surface waters and may impact downstream users of that water. Some components such as caffeine and pain killers (ibuprofen and acetaminophen) are often found immediately downstream of human wastewater sources. Measuring these compounds can therefore provide a means of measuring the impact of human activities on the receiving water. In considering various scientific studies, it appears that the risk to humans from the various metabolites of pharmaceuticals and other products that are excreted or disposed of in wastewater is very small. The main environmental risk seems to be associated with changes in the health of various organisms (e.g. fish) in the immediate vicinity of the waste water discharge.

A survey for various pharmaceutical metabolites and personal care products was carried out in the Upper Qu'Appelle River and Buffalo Pound Lake to identify if any potential problem or concern exists. Three sites were sampled in April and September and 47 different compounds analyzed at the parts per trillion level (0.000000001 grams per litre) by the Alberta Research Council using ion trap mass spectroscopy. A complete list of these analyses termed Drug N (neutrals) and Drug A (acids) is shown in the appendices. No detectable levels of the target compounds were found with the exception of cotinine a metabolite of nicotine (found in tobacco and related plants). Levels were ten parts per trillion (0.000000001 grams per litre) which corresponds to the analytical detection limit. Finding this single compound without other commonly found compounds such as caffeine is somewhat surprising. Nicotine is found in a variety of plants but its metabolite, cotinine is formed after consumption (or inhalation). One possible explanation is that cotinine might be more resistant to natural removal processes and degradation within surface waters.

The analyses performed thus far indicate Buffalo Pound Lake is not impacted by these compounds and therefore they pose minimal risk. This work will continue in coming years as additional compounds (most recently hormone compounds) become available for analyses.

FACTORS AFFECTING BUFFALO POUND LAKE WATER QUALITY

Reviewing the historical data base of raw water quality obtained from regular monitoring at the plant's raw water intake revealed interesting trends and potential explanations for the year to year variation seen in lake water quality. The biological productivity of the lake remains high as indicated by chlorophyll a levels (the green pigment involved in capturing energy from sunlight by cyanobacteria, green algae and plants). However a shift in the type of algae has been noted over the last 10-20 years from blue greens (cyanobacteria) to green algae. Cyanobacteria are associated with taste and odour episodes in treated water as well as the potential formation of microcystins, an algal metabolite that is harmful if ingested. (Microcystins are removed by the GAC contactors as well as being chemically destroyed by chlorination in the treatment plant). During the last twenty years, the nutrient regime of Buffalo Pound Lake has tended to be phosphorus limited (the limiting nutrient for algae growth). When phosphorus is found at higher levels, cyanobacteria could dominate in the lake during summer months because they can fix their own nitrogen (like legumes) from the air. Lower levels of phosphorus remove the competitive advantage that the cyanobacteria might otherwise have. This emphasises the importance of limiting phosphorus transport into the upper Qu'Appelle River and Buffalo Pound Lake by effective fertilizer and manure management, encouraging healthy, vegetated riparian zones around the water, as well as managing water flows to limit the transport of excessive sediment loads into Buffalo Pound Lake.

Various water quality factors were tested in statistical models as predictors of summer time chlorophyll a levels in Buffalo Pound Lake. Three factors came out in this analysis as being important: summer water temperature, (previous) winter time levels of phosphorus, and water diversion rates from the Qu'Appelle Dam. Summer water temperatures were the strongest indicator of potential algae growth but of course are out of practical control by lake management techniques. There is potential to limit phosphorus levels by the good watershed management techniques mentioned above. Moderate inflows of water (4-8 M^3/sec) from releases at the Qu'Appelle Dam are associated with good water quality in Buffalo Pound Lake. Releases must be high enough to minimize residence time of water and nutrients in the lake but not so high as to carry sediment and nutrients into the lake which stimulate algae growth.

WATERSHED MONITORING

Monitoring of the Upper Qu'Appelle River watershed including Buffalo Pound Lake is typically carried out on an annual basis. In 2009 watershed sampling was carried out four times between April and September and additional sampling points were included. Potential areas of concern within the watershed as indicated by elevated thermo-tolerant coliforms (also termed fecal coliforms) were identified. Spring runoff was also associated with higher levels of coliform organisms. These organisms are easily treated by disinfection processes within the plant but should be minimized by maintaining healthy vegetated riparian areas, livestock and manure management areas as well as the effective collection and disposal of human wastes.

The long-term watershed data collected by the Buffalo Pound Water Administration Board staff represents a valuable resource for examining water quality trends or issues. Copies of this database are requested regularly by government agencies and water quality researchers. The data is provided freely as a public service and as a means of encouraging new research into limnology and water treatment. Diversions from Lake Diefenbaker via the Upper Qu'Appelle River and Buffalo Pound Lake will increase if irrigated agriculture and industries are developed in Southern Saskatchewan. The watershed data collected since 1979 will provide a baseline for assessing the impacts of these future developments.

OPERATIONS BUDGET

The 2009 water rate for the cities of Regina and Moose Jaw increased by 9% from the 2008 rate to $194.08 per Megaliter. The electrical rate was set at $0.06846 per KWH for 2009, a 7.5% increase from 2008.

The cool weather in 2009 as well as the intermittent operation of the meat-packing plant in Moose Jaw resulted in a drop in sales from 2008 to 2009. Sales to Moose Jaw are 1.70% below plan; sales to Regina are 1.59% below plan. Combined year-to-date city sales in 2009 are 1.61% below plan compared to 1.2% above plan in 2008.

Sales to Regina dropped from 27,868 ML in 2008 to 27556 ML in 2009; sales to Moose Jaw dropped from 6633 ML in 2008 to 5996 in 2009. Sales to Regina decreased 1.1% from 2008, and sales to Moose Jaw decreased 9.6%.

Operations at the Buffalo Pound Water Treatment Plant resulted in a refundable surplus of approximately $669,019 in 2009.

Utilities costs were under plan in 2009. Due to the large decrease in treated water volumes electrical costs were below plan Natural gas costs were also under budget. Electrical revenues were also under plan due to reduced sales.

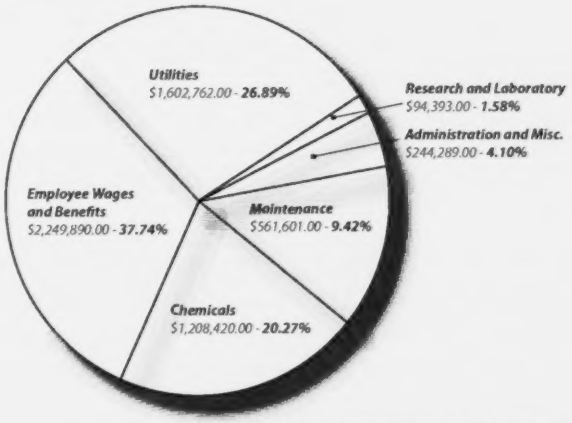
Chemicals costs were significantly under budget primarily due to improvements in raw water quality. Chlorine and alum dosages were significantly under plan; chlorine costs were $68,740 under budget, alum costs were $444,395 under budget. A reduction in the alum price effective June 1, 2009 was negotiated in 2009. Powdered activated carbon costs were $50,456 under budget. Granular activated carbon costs were $76,011 over plan due to a large increase in the price of GAC.

Audited financial statements are contained in Appendix 2.

Graph 4 summarizes expenses for 2009 as a percent of the total budget.

Graph 4

BUFFALO POUND WATER TREATMENT PLANT
SUMMARY OF EXPENSES - 2009



TOTAL EXPENSES: $5,961,355.00

APPENDICES

Appendix 1: Water Quality Data – 2009

- ~ Drinking Water Quality and Compliance Report for 2009
- ~ Buffalo Pound Water Treatment Plant Laboratory
- ~ Organics Analysis – Saskatchewan Research Council
- ~ Metals Analysis - Saskatchewan Research Council
- ~ Organics Analysis – Alberta Research Council

Appendix 2: Audited Financial Statements – 2009

Water Quality Data - 2009

BUFFALO POUND WATER TREATMENT PLANT LABORATORY

Analytical Data - 2009

Moose Jaw / Regina, Saskatchewan
December 2009

BUFFALO POUND WATER TREATMENT PLAN

DRINKING WATER QUALITY AND COMPLIANCE REPORT FOR 2009

INTRODUCTION

Saskatchewan Environment requires each Permittee to monitor water quality as stipulated under its Permit to Operate a Waterworks. Permittees are also required to prepare an annual report to their customers and Saskatchewan Environment summarizing the analytical results of the monitoring in a report entitled "Drinking Water Quality and Compliance Report."

For more information about the meaning and type of sample refer to Saskatchewan Environment's "Municipal Drinking Water Quality Monitoring Guidelines, November, 2002 EPB 202" or the associated website www.saskh20.ca.

Wherever the "less than sign" (<) is used it means that the parameter was not detected at the level indicated.

WATER QUALITY STANDARDS – BACTERIOLOGICAL QUALITY

According to its Permit to Operate a Waterworks the Buffalo Pound Water Treatment Plant is required to analyze one sample every week from the treated water for Bacteriological Quality. On every occasion no coliforms were detected.

Parameter	Limit	Number of Samples Submitted	Number of Samples Exceeding Limit
Total Coliforms	0 per 100 ml	52	0
Background Organisms	<200 per 100 ml	52	0

WATER QUALITY STANDARDS – FILTER TURBIDITY

The Buffalo Pound Water Treatment Plant is required to monitor the effluent turbidity from all twelve filters on a Continuous Basis. The turbidity from each individual filter shall be less than 0.3 NTU, 95% of the time. The turbidity shall not exceed 0.3 NTU for more than 12 consecutive hours and shall never exceed 1.0 NTU. If, on those rare occasions when the monthly average of the source water turbidity is less than 1.5 NTU, the water turbidity levels from each filter must be less than 0.2 NTU, 95% of the time, the turbidity shall not exceed 0.2 NTU for more than 12 consecutive hours and shall never exceed 1.0 NTU.

This Plant's SCADA Control System automatically generates an alarm if a filter effluent turbidity exceeds 0.3 NTU. If the turbidity exceeds 0.4 NTU at any time, the Plant's SCADA Control System automatically closes the filter effluent valve, turning off the filter. The plant's operating permit requires on-line turbidity monitoring on the effluent of each of its twelve filters. A problem with the turbidity monitor or data transfer system to the plant's SCADA requires a shutdown of the affected filter. To address this possibility the plant has a second independent turbidimeter on each filter so that continuous monitoring can be maintained even if the first turbidimeter fails.

WATER QUALITY STANDARDS – FLUORIDE

The Buffalo Pound Water Treatment Plant adds fluoride to the water pumped to the City of Moose Jaw and is required to monitor the fluoride level in that water on a continuous basis. The Maximum Acceptable Concentration (MAC) is 1.5 mg/l. Alarms signal a high residual dose at 1.3 mg/L. The target treatment level is 0.7 mg/L reflecting Health Canada's new recommended dosage level. Residual fluoride levels leaving the plant to Moose Jaw averaged 0.73 mg/L. The maximum recorded level of fluoride via a laboratory analysis for water pumped to Moose Jaw was 1.03 mg/L.

WATER QUALITY STANDARDS – CHLORINE RESIDUAL

To ensure adequate disinfection the Buffalo Pound Water Treatment Plant must monitor the chlorine residual of the treated water on a continuous basis and the free chlorine residual shall not be less than 0.1 milligrams per litre. The normal operating range for the free chlorine residual in the treated water is 0.9 to 1.1 mg/l. The SCADA control system will automatically shut off pumping to the Cities if the chlorine level is less than 0.5 mg/l. A high level chlorine alarm will alert the operator if chlorine levels in the clearwell exceed 1.3 mg/L.

WATER QUALITY STANDARDS – CHEMICAL – GENERAL

As part of the plant's "Permit to Operate" a general chemical analysis is required once in every three month period from the treated water. Only two of these parameters have an established Maximum Acceptable Concentration (MAC) limit. Five others have an Aesthetic Objective (AO) which is desirable but has no impact on human health.

Parameter (mg/l) unless stated	Feb 09	May 25	Aug 10	Nov 09	Limit MAC or AO (*)	No. of Samples Exceeding MAC or AO
Alkalinity	167	126	104	130	500*	0
Bicarbonate	204	153	127	158		0
Carbonate	ND	ND	ND	ND		
Chloride	17.6	13.1	14.8	15.0	250*	0
Conductivity (uS/cm)	633	477	487	512		0
Fluoride	0.13	0.11	0.11	0.13	1.5	0
Hardness	252	178	167	179	800*	0
Calcium	58.0	44	37.2	42		0
Magnesium	25.0	16.6	18.5	19.7	200*	0
Nitrate	0.35	<0.04	0.15	0.09	45	0
pH (pH units)	7.43	7.58	7.50	7.56	6.5 – 8.5*	0
Sodium	44.6	30.6	34.4	35.4	300*	0
Sulphate	154	104	117	110	500*	0
Total Dissolved Solids	428	300	296	324	1500*	0

ND – Not Detected

WATER QUALITY STANDARDS – CHEMICAL - HEALTH

The Buffalo Pound Water Treatment Plant is required to sample the treated water for the following parameters once in every six month period.

Parameter (mg/l)	June 03	Nov 23	Limit MAC, IMAC* Operational Guideline** or AO***	Number of Samples Exceeding Limit
Aluminum	0.027	0.050	0.1**	0
Arsenic	0.0004	0.0005	0.025*	0
Barium	0.063	0.053	1.0	0
Boron	0.03	0.04	5.0*	0
Cadmium	<0.0001	<0.0001	0.005	0
Chromium	<0.0005	<0.0005	0.05	0
Copper	<0.0002	0.0005	1.0***	0
Iron	0.0008	0.0021	0.3***	0
Lead	<0.0001	<0.0001	0.01	0
Manganese	<0.0005	<0.0005	0.05***	0
Selenium	0.0002	0.0002	0.01	0
Uranium	0.0009	0.0008	0.02*	0
Zinc	<0.0005	0.0069	5.0***	0

WATER QUALITY STANDARDS – PESTICIDES

Once per year the Buffalo Pound Water Treatment Plant is required to have the treated water analyzed for the following pesticides. Those noted on the permit are indicated below; the entire pesticide analysis is noted in the Appendix.

Parameter (mg/l)	Jul 07	Limit MAC or IMAC* or Operational Guideline**	Number of Samples Exceeding Limit
Atrazine	<0.000005	0.005*	0
Bromoxynil	<0.000005	0.005*	0
Carbofuran	<0.002	0.09	0
Chlorpyrifos	<0.000005	0.09	0
Dicamba	<0.000005	0.12	0
Dichlorophenoxyacetic Acid 2,4 (2,4-D)	<0.000005	0.1*	0
Diclofop-methyl	<0.00002	0.009	0
Dichlorprop 2-4DP	<0.000005	N/A	0
Dimethoate	<0.00005	0.02*	0
Glyphosate	<0.0002	0.28**	0
Malathion	<0.00005	0.19	0
Picloram	<0.000005	0.19*	0
Trifluralin	<0.000005	0.045*	0
Ethalfluralin	<0.000005	N/A	0
MCPA	<0.000005	N/A	0
Pentachlorophenol	<0.0001	0.06	0
Triallate	<0.000005	N/A	0

WATER QUALITY STANDARDS – DISINFECTION BY-PRODUCT - TRIHALOMETHANES

As part of the plant's "Permit to Operate" an analysis for Trihalomethanes is required once per month from the treated water. The MAC is 0.1 milligrams per litre, or, 100 micrograms per litre (parts per billion) for total trihalomethanes on a running quarterly average. No samples exceeded this concentration.

Parameter (ug/l)	Jan 12	Feb 09	Mar 02	Apr 06	May 04	Jun 08
Chloroform	23	27	24	26	34	1
Bromodichloromethane	9	10	9	9	8	<1
Dibromochloromethane	1	2	2	2	<1	<1
Bromoform	<1	<1	<1	<1	<1	<1
Total Trihalomethanes	33	39	34	36	42	1
	Jul 13	Aug 17	Sep 08	Oct 05	Nov 08	Dec 07
Chloroform	13	30	36	27	24	24
Bromodichloromethane	<1	5	8	7	8	8
Dibromochloromethane	<1	<1	<1	<1	<1	2
Bromoform	<1	<1	<1	<1	<1	<1
Total Trihalomethanes	13	34	44	34	32	34

WATER QUALITY STANDARDS – DISINFECTION BY-PRODUCT – HALOACETIC ACIDS (HAA5'S)

The Buffalo Pound Water Treatment Plant is obligated to sample for Haloacetic Acids every three months. The results are as follows:

Parameter (ug/l)	Jan 19	Apr 08	Jul 07	Oct 06	Limit MAC	Number of Samples Exceeding Limit
HAA5	39	44	<10	<10	80	0

WATER QUALITY STANDARDS – CYANIDE AND MERCURY

The Buffalo Pound Water Treatment Plant is required to submit two (2) samples per year for analysis for Cyanide and Mercury.

Parameter (mg/l)	June 03	Nov 23	Limit MAC	Number of Samples Exceeding Limit
Cyanide	<0.0001	<0.0001	0.2	0
Mercury	<0.00005	<0.00002	0.001	0

WATER QUALITY STANDARDS – ORGANICS PLUS MICROCYSTIN

The Buffalo Pound Water Treatment Plant is required to submit one (1) sample per year for analysis for various organics including Microcystin. Those noted on the permit are indicated below; the entire organic analysis is noted in the Appendix.

Parameter (mg/l)	Jul 07	Limit MAC, IMAC*	Number of Samples Exceeding Limit
Benzene	<0.0001	0.005	0
Benzo(a)pyrene	<0.00001	0.00001	0
Carbon Tetrachloride	<0.0001	0.005	0
Dichlorobenzene 1,2	<0.0001	0.2	0
Dichlorobenzene 1,4	<0.0001	0.005	0
Dichoroethane 1,2	<0.0001	0.005*	0
Dichloroethylene 1,1	<0.0001	0.014	0
Dichloromethane	<0.0001	0.005	0
Dichlorophenol 2,4	<0.00001	0.9	0
Ethylbenzene	<0.0001	0.0024	0
Monochlorobenzene	<0.0001	0.08	0
Toluene	<0.0001	0.024	0
Tetrachlorophenol 2,3,4,6	<0.0001	0.1	0
Trichloroethylene	<0.0001	0.05	0
Trichlorophenol 2,4,6	<0.0001	0.005	0
Vinyl Chloride	<0.0005	0.002	0
Xylenes	<0.0001	0.300	0
Microcystin	<0.0005 (Jul 27)	0.0015	0

2009 - BUFFALO POUND WATER QUALITY DATA
RAW LAKE WATER
PAGE 1

Parameters	Units	JAN Avg	FEB Avg	MAR Avg	APR Avg	MAY Avg	JUN Avg	JUL Avg	AUG Avg	SEP Avg	OCT Avg	NOV Avg	DEC Avg	YEAR AVG	YEAR MIN	YEAR MAX
PHYSICAL																
Colour (Apparent)	Pt/Co	15	15		35	10	5	20	25	25	15	10	5	18	5	50
Conductivity	µS/cm	623	630		633	475	481	460	472	486	496	501	538	517	456	642
Bench Diss. Oxygen	mg/L	9	7.6	6.1	9.8	9.5	8.6	8.6	8.2	8.3	11.1	12.2	11	9.4	5.8	12.8
Bench Diss. Oxygen	%	67.3	57.4	46.3	77.1	90.6	89.8	94.7	87.2	85.8	87.5	90.4	81.3	83.9	44.2	100.8
ON-LINE Diss. Oxygen	%	75.8	70.7	43.1	112.3	99.8	98.8	102.1	91.9	89	100.4	97.8	88.5	89.9	39.4	153
Odour	T.O.N.	29	15	17	297	161	104	71	122	85	83	55	47	91	13	480
pH	pH units	7.91	7.78	7.66	8	8.28	8.46	8.56	8.54	8.38	8.46	8.49	8.27	8.26	7.64	8.69
Temperature	° C	3.4	3.7	3.5	5.8	9.8	17.2	20	18.5	17.1	5.3	2.8	2.7	9.3	1.9	22.1
Turbidity	NTU	1.8	1.4	1.8	3.1	2.9	2.2	3.1	4.9	4.1	4	2.2	1.3	2.8	1	8.9
TDS	mg/L	372	422		402	290	296	274	296	304	294	314	320	329	274	422
TDS	mg/L(calc)	517	526		547	377	381	359	363	378	390	392	431	424	359	547
Langelier Index (RTW)	pH units (calc)	0.27	0.19		0.22	0.64	0.83	0.72	0.72	0.73	0.61	0.63	0.42	0.54	0.19	0.83
MAJOR CONSTITUENTS																
Alkalinity(p)	mg/L CaCO3	<DL	<DL	<DL	<DL	1	3	4	3	2	1	3	<DL	1	<DL	5
Alkalinity(total)	mg/L CaCO3	205	212	223	215	154	152	140	141	150	155	157	174	172	140	223
Bicarbonate	mg/L	251	259	272	262	185	179	162	166	179	186	185	212	206	158	272
Carbonate	mg/L	<DL	<DL	<DL	<DL	1	3	4	3	2	2	3	<DL	2	<DL	6
Calcium	mg/L	57	58		60	44	45	39	38	39	41	43	46	47	38	61
Magnesium	mg/L	25	139		25	17	15	18	19	19	19	20	22	21	17	26
Hardness (total)	mg/L CaCO3	246	149		256	181	179	168	167	173	180	181	201	200	167	263
Sodium	mg/L	45	25		42	30	31	33	34	35	35	35	38	37	30	45
Potassium	mg/L	5.2	61.5		4.8	3.9	4.1	3.9	4.2	4.2	4	4	4.3	4.3	3.9	5.2
Sulphate	mg/L	116	66		114	82	83	86	87	87	89	89	97	94	82	119
Chloride	mg/L	14	13.6		13.5	10.1	10.2	10.7	11.1	12	12	12	13.2	11.9	10.1	14.1
TRACE CONSTITUENTS																
Aluminum (dissolved 0.45µ)	ug/L	9	10		8	18	151	66	24	27	39	13	28	36	8	151
Ammonia N	mg/L N	0.12	0.25	0.15	0.13	<DL	<DL	<DL	0.09	0.13	<DL	0.07	0.15	0.09	<DL	0.25
BOD (5-day)	mg/L	3.1	1.4		4.4	1.8	2.4	1.6	2.3	1.7	3.6	3.3	2.5	2.6	1.4	4.4
Bromide	mg/L	<DL	<DL		<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
Chlorophyll a	mg/L	13	8	14	29	5	9	16	16	12	19	16	12	15	5	29
Fluoride	mg/L	0.2	0.21		0.52	0.16	0.16	0.17	0.18	0.19	0.18	0.17	0.18	0.24	0.16	0.83
Iron (dissolved)	mg/L	<DL	0.02		<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	0.02
Manganese (dissolved)	mg/L	0.01	0.04		0.12	<DL	<DL	<DL	<DL	<DL	<DL	<DL	0.06	0.03	<DL	0.13
Nitrate	mg/L	0.07	0.08	0.14	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	0.14
Organic N	mg/L N	0.07	0.44	0.48	0.55	0.38	0.4	0.5	0.44	0.44	0.6	0.52	0.43	0.49	0.38	0.67
Raw TOC	mg/L C (UV)	6.9	6.5	6.1	6.5	4.9	5.2	5.2	5.2	5.3	5.1	5.5	5.6	5.6	4.6	7
Raw DOC (GF diss)	mg/L C (UV)	6.3	6.2	5.8	5.8	4.5	4.6	4.7	4.8	4.9	4.8	5	5.2	5.2	4.1	6.5
UV absorbance @ 254nm	Abs 10cm	0.918	0.94	0.962	0.962	0.897	0.851	0.849	0.892	0.902	0.846	0.861	0.863	0.892	0.821	0.977
SUVA	L / mg m	1.458	1.532	1.656	1.672	2	1.834	1.806	1.86	1.849	1.755	1.724	1.649	1.743	1.447	2.174
PreFM UV abs @ 254nm	Abs 10cm	0.747	0.788	0.836	0.794	0.704	0.69	0.664	0.709	0.719	0.719	0.721	0.729	0.736	0.632	0.977
Phosphate(ortho)	µg/L P	18	19	11	4	<DL	5	4	2	12	8	6	6	7	<DL	19
Phosphate(total)	µg/L P	45	46	40	62	<DL	35	44	45	64	58	47	35	46	<DL	76
Silica (SiO3)	mg/L	6.5	6.7		7.4	3.2	2.5	2	1.5	2.8	3.1	2.5	1.4	3.6	1.4	7.4
Sulphide	µg/L															

Continued...

2009 - BUFFALO POUND WATER QUALITY DATA
RAW LAKE WATER

PAGE 2

Parameters	Units	JAN Avg	FEB Avg	MAR Avg	APR Avg	MAY Avg	JUN Avg	JUL Avg	AUG Avg	SEP Avg	OCT Avg	NOV Avg	DEC Avg	YEAR AVG	YEAR MIN	YEAR MAX
TRACE CONSTITUENTS																
PreFM																
TTHM's (total)	µg/L(calc)	29	29	28	36	45	42	45	51	48	31	28	29	37	26	53
Chloroform	µg/L	22	21	21	27	37	32	34	38	36	24	22	21	28	19	40
Bromodichloromethane	µg/L	7	7	6	8	7	9	10	11	11	7	6	7	8	6	12
Chlorodibromomethane	µg/L	<DL	2	1	1	<DL	1	1	1	2	<DL	<DL	1	1	<DL	2
Bromoform	µg/L	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
BIOLOGICAL																
Blue Green Algae (x10^-3)	per litre	<DL	<DL	<DL	<DL	<DL	120	650	206	276	356	<DL	<DL	141	<DL	2122
Green Algae (x10^-3)	per litre	11600	5245	1797	6095	5078	2328	1625	2997	1544	1881	2067	1898	3438	900	13022
Diatoms (x10^-3)	per litre	55	109	78	747	234	217	59	184	100	100	89	60	168	<DL	1844
Flagellates (x10^-3)	per litre	52	<DL	189	283	217	483	603	1617	896	592	642	460	519	<DL	2600
Crustaceans	per litre	<3	<3	<3	<3	3	<3	74	3	21	3	15	<3	10	<3	90
Nematodes (x10^-3)	per litre	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
Rotifers (x10^-3)	per litre	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	44
Other (x10^-3)	per litre	474	17	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	32	<DL	1100
Total Green & B-G	per litre	11600	5245	1803	6100	5078	2447	2275	3203	1820	2237	2067	1898	5271	1933	10266
BACTERIOLOGICAL																
Total Coliforms	per 100 ml	<DL	<DL	1	<DL	17	2	40	550	440	<DL	1	6	94	<DL	1200
Total Coliforms (background)	per 100 ml	107	61	96	64	680	1260	8200	11100	8960	4025	541	108	2963	26	14000
Faecal Coliforms	per 100 ml	<DL	<DL	<DL	<DL	2	2	2	9	29	5	3	<DL	5	<DL	57
Standard Plate Count	per 1 ml	8	7	5	40	97	61	507	490	170	88	102	20	135	2	640
CHEMICAL DOSES																
Alum	mg/L	75	78	70	73	49	49	55	60	61	48	46	50	59	45	80
Alum/Raw DOC	ratio	11.63	12.63	11.76	12.61	10.84	10.57	11.7	12.5	12.5	9.88	9.26	9.56	11.24	8.65	13.83
Alum-DOC Stoich	ratio	0.94	1.02	0.95	1.02	0.88	0.86	0.95	1.01	1.01	0.8	0.75	0.78	0.91	0.7	1.12
Chlorine-pre	mg/L	3.8	4.4	4.1	3.4	3.3	2.3	2.9	3.7	3.2	2.6	2.6	2.8	3.2	2.2	4.7
Chlorine-intermed	mg/L															
Chlorine-post	mg/L	0.7	0.8	0.7	1.1	0.9	1.3	1.4	1.5	1.4	1.4	1.3	0.8	1.1	0.6	1.7
Plant Flow	MLD	83.5	76.3	92.4	84.5	87.8	132.6	126.5	100	116.2	83.5	88.5	88	97.5	51	176
Qu'Appelle Dam Flow	cu m/s	2.3	2.3	2.3	3.3	8.9	5.5	5.5	5.5	3.5	2.1	1		4	1	11
Fluoride (Set Point for MJ)	mg/L	0.7	0.7	0.7	0.7	0.7	0.7			0.7	0.7	0.69	0.65	0.69	0.65	0.7
Powdered Carbon	mg/L															
CPAC Train A	mg/L															
CPAC Train B	mg/L															
Total Chlorine dose	mg/L (Calc)	4.5	5.2	4.8	4.5	4.2	3.6	4.3	5.2	4.6	4	3.9	3.5	4.3	3.2	5.6
Date GAC's ON														25-May		
Date GAC's OFF														20-Nov		
Date Ice ON Lake														25-Nov		
Date Ice OFF Lake														01-May		
Date PAC ON														10-Jan		
Date PAC OFF																
Chlorine Residuals Exit Plant (week avg.)																
Free Chlorine	mg/L	1.08	1.07	1.09	1.08	1.07	1.1	1.08	1.08	1.1	1.09	1.09	1.09	1.09	1.04	1.14
Combined Chlorine	mg/L	0.34	0.33	0.33	0.31	0.19	0.06	0.1	0.12	0.12	0.15	0.22	0.31	0.21	<DL	0.35

2009 - BUFFALO POUND WATER QUALITY DATA
TREATED WATER

PAGE 3

Parameters	Units	JAN Avg	FEB Avg	MAR Avg	APR Avg	MAY Avg	JUN Avg	JUL Avg	AUG Avg	SEP Avg	OCT Avg	NOV Avg	DEC Avg	YEAR AVG	YEAR MIN	YEAR MAX
PHYSICAL																
Colour (Apparent)	Pt/Co	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	25	<DL	<DL	<DL	<DL	<DL	25
Conductivity	µS/cm	626	633	659	656	477	493	465	487	485	509	512	549	546	465	659
Diss. Oxygen	mg/L	12	11.3	12.3	11.3	9.6	8.8	8.5	8.3	8.5	12	12.2	11.3	10.3	8.1	12.3
% Sat. Diss. Oxygen	%	89.7	84.5	92.7	86.6	88.9	86.1	91.9	89	89.8	90.7	90.7	82.6	88.6	82.6	92.7
Odour(Dechlorinated)	T.O.N.	5	4	5	10	7	1	2	1	2	2	4	8	4	<1	14
PreGAC Odour	T.O.N.						10	16	25	17	18	12		16	7	32
and Filtration	%	79.40%	76.60%	70.40%	92.30%	95.50%	86.70%	78.10%	79.70%	78.00%	78.60%	77.80%	82.60%	81.40%	58.80%	97.50%
Odour Removal Overall	%	79.40%	76.60%	70.40%	92.30%	95.50%	99.50%	97.70%	99.20%	97.90%	97.90%	92.00%	82.60%	90.50%	58.80%	100.00%
PreFM pH	pH units	7.71	7.56	7.51	7.73	7.97	8.23	8.26	8.17	8.05	8.31	8.24	8.03	7.98	7.41	8.45
Coagulation pH - Channel 1	pH units	7.08	7.1	7.14	7.15	7.21	7.23	7.12	7.08	7.1	7.27	7.3	7.19	7.17	6.99	7.35
Coagulation pH - Channel 2	pH units	7.06	7.07	7.15	7.16	7.22	7.27	7.15	7.1	7.12	7.3	7.32	7.21	7.18	6.97	7.35
Clearwell pH	pH units	7.39	7.43	7.41	7.47	7.54	7.6	7.45	7.55	7.55	7.59	7.59	7.46	7.5	7.24	7.72
Temperature	°C	3.2	3.2	3.4	5.6	9.6	17.7	20.7	19	17.8	5.7	2.5	2.5	9.3	1.5	22.6
Turbidity	NTU	0.09	0.07	0.08	0.08	0.07	0.07	0.08	0.1	0.1	0.07	0.08	0.09	0.08	0.06	0.11
Total Dissolved Solids	mg/L	386	428	432	436	300	296	280	296	310	292	324	338	343	280	436
Total Dissolved Solids	mg/L(calc)	508	514	535	533	369	375	352	355	370	383	386	420	425	352	535
Turbidity Log Removal	(calc)	1.25	1.31	1.31	1.56	1.63	1.48	1.56	1.66	1.62	1.76	1.44	1.14	1.48	1.02	1.94
Langelier Index (RTW)	pH units (calc)	-0.33	-0.31		-0.17	-0.23	-0.04	-0.27	-0.36	-0.21	-0.37	-0.41	-0.4	-0.28	-0.41	-0.04
MAJOR CONSTITUENTS																
Alkalinity(p)	mg/L CaCO3	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
Alkalinity(total)	mg/L CaCO3	168	167	181	182	126	130	110	105	117	129	130	142	141	105	182
Bicarbonate	mg/L	204	204	221	222	153	158	134	127	143	157	158	173	171	127	222
Carbonate	mg/L	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
Calcium	mg/L	57	58	61	61	44	44	38	37	38	40	42	45	47	37	61
Magnesium	mg/L	25	25	26	26	17	18	18	19	19	20	20	21	21	17	26
Hardness (total)	mg/L CaCO3	245	252	257	261	179	181	167	167	172	178	179	200	203	167	261
Sodium	mg/L	46	45	46	44	31	31	33	34	35	35	35	38	38	31	46
Potassium	mg/L	5.2	5.3	5.4	5	4	4.1	3.9	4.2	4.2	3.9	4	4.3	4.5	3.9	5.4
Sulphate	mg/L	148	154	151	152	105	104	110	117	113	110	110	121	124	104	154
Chloride	mg/L	16.9	17.6	18.2	16.9	13.1	12.8	13.9	14.8	14.9	14.4	15	15.9	15.4	12.8	18.2
TRACE CONSTITUENTS																
CLEAR WELL																
Aluminum (dissolved 0.45µ)	µg/L Chart	44	43	41	50	26	21	21	13	22	14	18	27	28	13	50
Aluminum (total)	µg/L Chart	58	51	62	51	30	22	22	14	24	14	18	33	33	14	62
Aluminum (total 12 mo avg)	µg/L	56	47	45	46	46	47	47	47	48	47	38	33			
Aluminum (particulate)	µg/L (Calc)	14	8	21	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	6	<DL	<DL	21
Mixed Media Filter A																
Aluminum (total)	µg/L	62	51	68	51	24	39	40	28	47	63	45	32	46	24	68
Mixed Media Filter L																
Aluminum (total)	µg/L	50	40	70	38	25	37	41	30	50	60	38	34	43	25	70
PREGAC																
Aluminum (dissolved)	µg/L						36	38	26	35	31			33	26	38
Aluminum (total)	µg/L Chart						40	42	29	51	52			43	29	52
Ammonia N	mg/L N	<DL	<DL	<DL	<DL	0.04	0.06	<DL	0.04	<DL	<DL	<DL	0.06	<DL	<DL	0.06
Bromide	mg/L	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
Fluoride	mg/L	0.12	0.13	0.13	0.14	0.11	0.11	0.12	0.11	0.12	0.13	0.13	0.12	0.12	0.11	0.14
Fluoride (MJ dose by ISE)	mg/L (wk avg)	1.03		0.65	0.78	0.68	0.56			0.79	0.75	0.72	0.69	0.73	0.46	1.03
Iron (dissolved)	mg/L	<DL	<DL	0.02	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	0.02
Iron (total)	mg/L	<DL	<DL	0.02	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	0.02
Manganese (dissolved)	mg/L	0.01	<DL	0.01	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	0.01
Manganese (total)	mg/L	0.01	<DL	0.01	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	0.01
Nitrate	mg/L N	0.08	0.08	0.1	0.07	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	0.1
Organic N	mg/L N	0.61	0.25	0.26	0.21	0.08	0.04	0.07	0.08	0.17	0.16	0.2	0.2	0.19	0.04	0.61
CW TOC	mg/L C	4.3	4.3	4.2	4.3	2.8	0.6	1.3	1.6	2	2.5	3.2	3.7	2.9	0.3	4.5
CW DOC (GF diss)	mg/L C	4.3	4.3	4.1	4.2	2.8	0.6	1.2	1.6	2	2.5	3.1	3.8	2.9	0.3	4.4
PreGAC DOC (GF diss)	mg/L C						3.2	3.2	3.2	3.3	3.6	3.8		3.4	3	4
Filtration	% Removal	32.80%	30.50%	28.80%	27.60%	37.80%	30.60%	32.10%	33.10%	31.50%	25.00%	26.50%	27.30%	30.30%	18.40%	41.70%
DOC Removal by GAC Filtration	% Removal						81.20%	60.80%	49.60%	39.20%	30.80%	22.00%		48.90%	20.00%	90.00%
Total DOC (% Removal)	% Removal	32.80%	30.50%	28.80%	27.60%	37.80%	86.90%	73.30%	66.40%	58.60%	47.80%	38.80%	27.30%	47.60%	21.20%	93.50%
254nm)	Abs 10cm	0.502	0.524	0.562	0.54	0.414	0.029	0.096	0.131	0.183	0.244	0.347	0.479	0.336	0.015	0.593
254nm)	Abs 10cm						0.439	0.401	0.421	0.447	0.479	0.479		0.443	0.376	0.504
Conventional SUVA	L / mg m	1.181	1.228	1.355	1.298	1.483	1.365	1.272	1.305	1.34	1.328	1.292	1.261	1.311	1.147	1.583
CW SUVA	L / mg m	1.181	1.228	1.355	1.298	1.483	0.494	0.689	0.82	0.91	0.971	1.128	1.261	1.063	0.378	1.583
Phosphate(ortho)	µg/L P	<DL	<DL	<DL	<DL	<DL	9	3	<DL	<DL	<DL	4	<DL	<DL	<DL	9
Phosphate(total)	µg/L P	7	5	17	7	<DL	13	29	<DL	6	6	8	4	10	<DL	53
Silica (SiO3)	mg/L	6.1	6.3	6.7	6.9	3.2	2.6	1.8	1.5	2.6	3	2.4	1.3	3.7	1.3	6.9
Sulphide	µg/L															

Continued...

2009 - BUFFALO POUND WATER QUALITY DATA
TREATED WATER

PAGE 4

Parameters	Units	JAN Avg	FEB Avg	MAR Avg	APR Avg	MAY Avg	JUN Avg	JUL Avg	AUG Avg	SEP Avg	OCT Avg	NOV Avg	DEC Avg	YEAR AVG	YEAR MIN	YEAR MAX
TRACE CONSTITUENTS																
CLEARWELL																
TTHM's (total)	µg/L(calc)	35	37	35	43	45	2	18	35	43	32	32	35	32	1	48
Chloroform	µg/L	25	26	25	31	36	2	17	30	35	24	24	25	25	1	38
Bromodichloromethane	µg/L	9	9	9	10	9	<DL	<DL	5	8	7	8	9	7	<DL	11
Chlorodibromomethane	µg/L	1	2	2	2	<DL	<DL	<DL	<DL	<DL	<DL	<DL	2	1	<DL	2
Bromoform	µg/L	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
CHANNEL																
TTHM's (total)	µg/L(calc)	31	35	32	29		44	42	44	49	32	29	32	36	29	49
Chloroform	µg/L	22	24	23	21		33	30	32	35	24	22	22	26	21	35
Bromodichloromethane	µg/L	8	9	8	7		10	10	10	12	8	7	8	9	7	12
Chlorodibromomethane	µg/L	1	2	1	1		1	2	2	2	<DL	<DL	2	1	<DL	2
Bromoform	µg/L	<DL	<DL	<DL	<DL		<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
PreGAC																
TTHM's (total)	µg/L(calc)					40	44	45	51	50	34	30		43	30	52
Chloroform	µg/L					32	33	32	37	36	25	23		32	22	38
Bromodichloromethane	µg/L					8	10	11	12	12	8	7		10	7	12
Chlorodibromomethane	µg/L					<DL	1	2	2	2	<DL	<DL		1	<DL	2
Bromoform	µg/L					<DL	<DL	<DL	<DL	<DL	<DL	<DL		<DL	<DL	<DL
BIOLOGICAL																
Blue Green Algae	per litre	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
Green Algae	per litre	1100	44444	99999	22222	11111	33333	<DL	77777	11111	77777	<DL	<DL	31573	<DL	99999
Diatoms	per litre	<DL	<DL	<DL	<DL	<DL	<DL	11111	<DL	<DL	<DL	<DL	<DL	926	<DL	11111
Flagellates	per litre	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
Crustaceans	per litre	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nematodes	per litre	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
Rotifers	per litre	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
Other	per litre	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
BACTERIOLOGICAL																
Total Coliforms	per 100 ml	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
Total Coliforms (background)	per 100 ml	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	1
Faecal Coliforms	per 100 ml															
Standard Plate Count	per 1 mL	<DL	<DL	<DL	<DL	<DL	<DL	4	10.5	6.4	<DL	<DL	<DL	1.8	<DL	

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1791

Contact: MMWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : SKMDWQ GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Raw Water
Matrix : 9
SmpDate: 7-Jul-09 @ 0933 Samplers..ID1 :
EndDate: @ ..ID2 :

VOLATILE PRIORITY POLLUTANTS
METHOD: IE505
SCAN: VPP

	TimeLines (days) from sample date	
	Max	Actual
Date Received : 8-Jul-09 by: SS	-	1 —
Date Extracted: 15-Jul-09 by: SS	7	8 *
Date Analyzed : 16-Jul-09 by: SS	7	9 *
Raw DataFile : V1791		

VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-
100651	1,1,1,2-Tetrachloroethane	0.0		.1	.1
95224	1,1,2,2-Tetrachloroethane	0.0		.1	.1
95214	1,1-Dichloroethane	0.0		.1	.1
100645	1,1-Dichloropropylene	0.0		.1	.1
100655	1,2,3-Trichloropropane	0.0		.1	.1
100656	1,2,4-Trimethylbenzene	0.0		.1	.1
100641	1,2-Dibromoethane	0.0		.1	.1
95215	1,2-Dichloroethane	0.0		.1	.1
100657	1,3,5-Trimethylbenzene	0.0		.1	.1
100644	1,3-Dichloropropane	0.0		.1	.1
100643	2,2-Dichloropropane	0.0		.1	.1
100638	2-Chlorotoluene	0.0		.1	.1
95200	Benzene	0.0		.1	.1
95201	Bromodichloromethane	0.0		.1	.1
95203	Bromomethane	0.0		.1	.1
95205	Chlorobenzene	0.0		.1	.1
95208	Chloroform	.2	H	.1	.1
95209	Dibromochloromethane	0.0		.1	.1
95221	Ethyl benzene	0.0		.1	.1
100647	Isopropylbenzene	0.0		.1	.1
95222	Methylene chloride	0.0		2.0	.1
95223	Styrene	0.0		.1	.1
95225	Tetrachloroethylene	0.0		.3	.1
100654	Trichloroethylene	0.0		.1	.1
95232	Vinyl chloride	0.0		.5	.1
100642	cis-1,2-Dichloroethylene	0.0		.1	.1
95234	m,p-Xylene	0.0		.1	.1
100650	n-Propylbenzene	0.0		.1	.1
100648	p-Isopropyltoluene	0.0		.1	.1
100636	tert-Butylbenzene	0.0		.1	.1
95220	trans-1,3-Dichloropropylene	0.0		.3	.1
95227	1,1,1-Trichloroethane	0.0		.1	.1
95228	1,1,2-Trichloroethane	0.0		.1	.1
95216	1,1-Dichloroethylene	0.0		.1	.1
100652	1,2,3-Trichlorobenzene	0.0		.1	.1
100653	1,2,4-Trichlorobenzene	0.0		.1	.1
100640	1,2-Dibromo-3-chloropropane	0.0		.3	.1
95211	1,2-Dichlorobenzene	0.0		.1	.1
95218	1,2-Dichloropropane	0.0		.1	.1
95212	1,3-Dichlorobenzene	0.0		.1	.1
95213	1,4-Dichlorobenzene	0.0		.1	.1
95207	2-Chloroethoryethylene	0.0		.4	.1
100639	4-Chlorotoluene	0.0		.1	.1
100634	Bromobenzene	0.0		.1	.1
95202	Bromoform	0.0		.5	.1
95204	Carbon tetrachloride	0.0		.1	.1
95206	Chloroethane	0.0		.1	.1
106204	Chloromethane	0.0		.5	.1
95210	Dibromomethane	0.0		.1	.1
100646	Hexachlorobutadiene	0.0		.3	.1
102608	MIBE	0.0		.1	.1
100649	Naphthalene	0.0		.1	.1
100397	TRIHALOMETHANES	.2	H	.1	.1
95226	Toluene	0.0		.1	.1
95229	Trichlorofluoromethane	0.0		.1	.1
100407	XYLENES	0.0		.1	.1
95219	cis-1,3-Dichloropropylene	0.0		.3	.1
100637	n-Butylbenzene	0.0		.1	.1
95233	o-Xylene	0.0		.1	.1
100635	sec-Butylbenzene	0.0		.1	.1
95217	trans-1,2-Dichloroethylene	0.0		.1	.1

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 16-Jul-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MMWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1791

Contact: M4WS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : SRMDWQ GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Raw Water
Matrix : 9
SmpDate: 7-Jul-09 @ 0933 Samplers..ID1 :
EndDate: @ ..ID2 :

VOLATILE PRIORITY POLLUTANTS
METHOD: IE505
SCAN: VPP

TimeLines (days) from sample date	Max	Actual
Date Received : 8-Jul-09 by: SS	-	1 —
Date Extracted: 15-Jul-09 by: SS	7	8 *
Date Analyzed : 16-Jul-09 by: SS	7	9 *

Raw DataFile : V1791

TENTATIVELY IDENTIFIED COMPOUNDS // COMMENTS	ESTIMATED CONCENTRATION
No additional compounds reported	

Laboratory's comments regarding this sample:

The following items regarding the sample were recorded. A Yes notation indicates a problem with the specified item.

Inappropriate Sample Container -
Inappropriate Temperature -
Inappropriate Headspace -
Broken / Leaking Container -

This sample was analyzed by GC/MS. An additional GC/FID scan may have been used for screening purposes and to assist with quantitative data analysis.
Estimated concentrations for tentively identified compounds are calculated assuming an equal response to internal standards.
* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.
** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 16-Jul-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: M4WS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"
Please check the mailing information and inform the lab if changes are required.

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1792

Contact: MWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : SKMDWQ GrpSmpNo :
StaNo : SK05JGD017 StaType:
Comment: Raw Water
Matrix : 9
SmpDate: 7-Jul-09 @ 0933 Samplers..ID1 :
EndDate: @ ..ID2 :

EXTRACTABLE PRIORITY POLLUTANTS
METHOD: IE340 | TimeLines (days)
SCAN: EPP | from sample date
| Max Actual
Date Received : 8-Jul-09 by: SS - 1 —
Date Extracted: 16-Jul-09 by: drc 7 9 *
Date Analyzed : 5-Aug-09 by: drc 21 29 *
Raw DataFile : E1792

VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-	VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-
100730	1,2,4-Trichlorobenzene	0.0		.1	.1	100734	1,2-Diphenylhydrazine	0.0		.1	.1
103632	2,3,4,6-Tetrachlorophenol	0.0		.1	.2	100708	2,4,6-Trichlorophenol	0.0		.1	.2
100700	2,4-Dichlorophenol	0.0		.1	.2	100701	2,4-Dimethylphenol	0.0		.2	.2
100703	2,4-Dinitrophenol	0.0		.1	.2	100732	2,4-Dinitrotoluene	0.0		.1	.1
100733	2,6-Dinitrotoluene	0.0		.1	.1	100725	2-Chloronaphthalene	0.0		.1	.1
100699	2-Chlorophenol	0.0		.2	.2	100702	2-Methyl-4,6-dinitrophenol	0.0		.1	.2
100704	2-Nitrophenol	0.0		.1	.2	100738	4-Bromophenyl phenyl ether	0.0		.1	.1
100698	4-Chloro-3-methylphenol	0.0		.1	.2	100742	4-Chlorophenyl phenyl ether	0.0		.1	.1
100705	4-Nitrophenol	0.0		.1	.2	100709	Acenaphthene	0.0		.1	.1
100710	Acenaphthylene	0.0		.1	.1	100711	Anthracene	0.0		.1	.1
100731	Benzidine	0.0		.2	.2	100712	Benzo(a)anthracene	0.0		.1	.1
100716	Benzo(a)pyrene	0.0		.1	.2	100713	Benzo(b)fluoranthene	0.0		.1	.1
100715	Benzo(ghi)perylene	0.0		.2	.1	100714	Benzo(k)fluoranthene	0.0		.1	.1
100739	Bis(2-chloroethoxy)methane	0.0		.1	.1	100740	Bis(2-chloroethyl)ether	0.0		.1	.1
100741	Bis(2-chloroisopropyl)ether	0.0		.1	.1	100748	Bis(2-ethylhexyl)phthalate	.8	H	.1	.1
100743	Butylbenzylphthalate	0.0		.1	.1	100717	Chrysene	0.0		.1	.1
100744	Di-n-butylphthalate	0.0		.1	.1	100747	Di-n-octyl phthalate	0.0		.1	.1
100718	Dibenzo(ah)anthracene	0.0		.5	.1	100745	Diethyl phthalate	0.0		.1	.1
100746	Dimethyl phthalate	0.0		.1	.1	100719	Fluoranthene	0.0		.1	.1
100720	Fluorene	0.0		.1	.1	100726	Hexachlorobenzene	0.0		.1	.1
100727	Hexachlorobutadiene	0.0		.5	.1	100728	Hexachlorocyclopentadiene	0.0		.1	.1
100729	Hexachloroethane	0.0		.5	.1	100721	Indeno(1,2,3-cd)pyrene	0.0		.1	.1
100749	Isophorone	0.0		.1	.1	100737	N-Nitroso-di-n-propylamine	0.0		.2	.1
100736	N-Nitrosodiphenylamine	0.0		.1	.1	100722	Naphthalene	0.0		.1	.1
100735	Nitrobenzene	0.0		.1	.1	100706	Pentachlorophenol	0.0		.1	.2
100723	Phenanthrene	0.0		.1	.1	100707	Phenol	0.0		.1	.2
100724	Pyrene	0.0		.1	.1						

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 6-Aug-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the lab if changes are required.

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1792

Contact: MWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : SKMDWQ GrpSmpNo :
StaNo : SK05JGD017 StaType:
Comment: Raw Water
Matrix : 9
SmpDate: 7-Jul-09 @ 0933 Samplers..ID1 :
EndDate: @ ..ID2 :

EXTRACTABLE PRIORITY POLLUTANTS
METHOD: IE340 | TimeLines (days)
SCAN: EPP | from sample date

	Max	Actual	
Date Received : 8-Jul-09 by: SS	-	1	—
Date Extracted: 16-Jul-09 by: drc	7	9	*
Date Analyzed : 5-Aug-09 by: drc	21	29	*

Raw DataFile : E1792

TENTATIVELY IDENTIFIED COMPOUNDS // COMMENTS	ESTIMATED CONCENTRATION
No additional compounds reported	

Laboratory's comments regarding this sample:

The following items regarding the sample were recorded. A Yes notation indicates a problem with the specified item.

Inappropriate Sample Container -
Inappropriate Temperature -
Inappropriate Headspace -
Broken / Leaking Container -

This sample was analyzed by GC/MS. An additional GC/FID scan may have been used for screening purposes and to assist with quantitative data analysis.
Estimated concentrations for tentively identified compounds are calculated assuming an equal response to internal standards.
* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.
** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 6-Aug-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the lab if changes are required.

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1793

Contact: MMWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : SKMDWQ GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Raw Water
Matrix : 9
SmpDate: 7-Jul-09 @ 0933 Samplers..ID1 :
EndDate: @ ..ID2 :

PESTICIDE ANALYSIS
METHOD: EM443 | TimeLines (days)
SCAN: PESTE | from sample date
| Max Actual
Date Received : 8-Jul-09 by: SS - 1 —
Date Extracted: 8-Jul-09 by: ARJ 10 1 ok
Date Analyzed : 13-Jul-09 by: ARJ 20 6 ok
Raw DataFile : p1793

VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-	VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-
100667	2,4-D	.036	H	.005	.002	100668	2,4-DB	0.000		.005	.002
100669	2,4-DP	0.000		.005	.002	99888	2,4-dichlorophenol	0.000		.010	.004
99887	4-chloro-2-methylphenol	0.000		.010	.004	97938	Aldicarb	0.000		.100	.020
102929	Aldrin	0.000		.005	.002	106769	Aminopyralid	0.000		.010	.003
100674	Atrazine	0.000		.005	.002	99897	Bentazon	0.000		.005	.002
100675	Bromacil	0.000		.030	.004	100676	Bromoxynil	0.000		.005	.002
100677	Carbathiin (Carboxin)	0.000		.100	.020	99889	Chlorothalonil	0.000		.005	.002
100684	Chlorpyrifos (Dursban)	0.000		.005	.002	99881	Clodinafop acid metabolite	0.000		.020	.004
99880	Clodinafop-propargyl	0.000		.040	.056	100688	Clopyralid (Lontrel)	0.000		.020	.004
100678	Cyanazine	0.000		.050	.008	102609	Desethyl atrazine	0.000		.050	.008
102610	Desisopropyl atrazine	0.000		.050	.008	100679	Diazinon	0.000		.005	.002
103639	Dicamba (Banvel)	0.000		.005	.002	100681	Diclofop-methyl (Hoe Grass)	0.000		.020	.004
102930	Dieldrin	0.000		.005	.002	102618	Dimethoate (Cygon)	0.000		.050	.007
100682	Disulfoton (Di-Syston)	0.000		.200	.050	100683	Diuron	0.000		.200	.250
100685	Ethalfluralin (Edge)	0.000		.005	.002	100686	Ethion	0.000		.100	.020
99898	Ethofumesate	0.000		.005	.002	102613	Fenoxaprop-P-ethyl	0.000		.040	.008
99894	Fluazifop	0.000		.010	.004	99895	Fluroxypyr	0.000		.010	.004
100687	Guthion	0.000		.200	.020	99892	Hexaconazole	0.000		.050	.008
102088	Imazamethabenz-methyl(Assert)	0.000		.050	.044	103141	Imazamox	0.000		.020	.002
102612	Imazethapyr	0.000		.020	.004	99890	Iprodione	0.000		.020	.004
99899	Linuron	0.000		.020	.004	100690	MCPA	.005	H	.005	.002
100691	MCPB	0.000		.020	.004	100692	MCPP (Mecoprop)	0.000		.005	.002
100689	Malathion	0.000		.050	.008	99893	Metalaxyl-M	0.000		.010	.004
97934	Methomyl	0.000		.100	.020	102935	Metolachlor	0.000		.005	.002
103631	Metribuzin	0.000		.010	.004	74365	Napropamide	0.000		.020	.004
97933	Oxycarboxin	0.000		.050	.008	103630	Parathion	0.000		.010	.004
100694	Phorate (Thimet)	0.000		.005	.002	100693	Picloram (Tordon)	0.000		.005	.002

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 14-Jul-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MMWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the Lab if changes are required. page 1 of 1

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1793

Contact: MWWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : SKMDWQ GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Raw Water
Matrix : 9
SmpDate: 7-Jul-09 @ 0933 Samplers..ID1 :
EndDate: @ ..ID2 :

PESTICIDE ANALYSIS
METHOD: EM443 | TimeLines (days)
SCAN: PESTE | from sample date
| Max Actual
Date Received : 8-Jul-09 by: SS - 1
Date Extracted: 8-Jul-09 by: ARJ 10 1 ok
Date Analyzed : 13-Jul-09 by: ARJ 20 6 ok
Raw DataFile : p1793

VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-	VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-
99891	Propiconazole	0.000		.050	.008	102614	Pyridaben	0.000		.020	.004
102611	Quinclorac	0.000		.005	.002	99896	Quizalofop	0.000		.030	.004
103824	Simazine	0.000		.010	.004	100695	Terbufos	0.000		.030	.004
74474	Thiamethoxam	0.000		.050	.008	100696	Triallate (Avadex BW)	0.000		.005	.002
103825	Triclopyr	0.000		.010	.004	100697	Trifluralin (Treflan)	0.000		.005	.002
97932	Vinclozolin	0.000		.010	.004	100670	alpha-BHC	0.000		.005	.002
100671	alpha-Endosulfan	0.000		.005	.002	100672	gamma-BHC (Lindane)	0.000		.005	.002
100673	p,p-Methoxychlor	0.000		.030	.004						

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
Date: 14-Jul-09
BAG 4000, VEGREVILLE, ALBERTA
Contact Person: Grant Prill T9C 1T4 (780) 632-8455

mail to: MWWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the lab if changes are required. page 1 of 1

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1794

POLYCYCLIC AROMATIC HYDROCARBONS

Contact: MWWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : SRMDMQ GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Raw Water
Matrix : 9
SmpDate: 7-Jul-09 @ 0933 Samplers..ID1 :
EndDate: @ ..ID2 :

METHOD: - - -
SCAN: PAH

TimeLines (days)		
from sample date		
	Max	Actual
Date Received : 8-Jul-09 by: SS	-	1 —
Date Extracted: 24-Jul-09 by: rmr	11	17 *
Date Analyzed : 24-Jul-09 by: rmr	21	17 ok
Raw DataFile : P1794		

GC/MSD SIM DATA

VMV_CODE	COMPOUND NAME	ug/L	MDL flag	VMV_CODE	COMPOUND NAME	ug/L	MDL flag
103142	3-Methylchloranthrene	0.00	.01	103143	7,12-Dimethylbenz(a)anthracen	0.00	.01
103144	Acenaphthene	0.00	.01	103145	Acenaphthylene	0.00	.01
103146	Acridine	0.00	.01	103147	Anthracene	0.00	.01
103148	Benzo(a)anthracene	0.00	.01	103149	Benzo(a)pyrene	0.00	.01
103150	Benzo(b,j,k)fluoranthene	0.00	.01	103151	Benzo(c)phenanthrene	0.00	.01
103152	Benzo(e)pyrene	0.00	.01	103153	Benzo(ghi)perylene	0.00	.01
103154	Chrysene	0.00	.01	103155	Dibenzo(a,h)pyrene	0.00	.01
103156	Dibenzo(a,i)pyrene	0.00	.01	103157	Dibenzo(a,l)pyrene	0.00	.01
103158	Dibenzo(ah)anthracene	0.00	.01	103159	Fluoranthene	0.00	.01
103160	Fluorene	0.00	.01	103161	Indeno(1,2,3-cd)pyrene	0.00	.01
103162	Naphthalene	0.00	.01	107132	Perylene	0.00	.01
103163	Phenanthrene	0.00	.01	103164	Pyrene	0.00	.01
103761	Retene	0.00	.01				

ARC Remarks:

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 5-Aug-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the lab if changes are required. page 1 of 1

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1795

Contact: MWWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : SRMDMQ GrpSmpNo :
StaNo : SK05JGD017 StaType:
Comment: Raw Water
Matrix : 9
SmpDate: 7-Jul-09 @ 0933 Samplers..ID1 :
EndDate: @ ..ID2 :

GLYPHOSATE, AMPA AND GLUFOSINATE
METHOD: EC/16 | TimeLines (days)
SCAN: GLYPH | from sample date
| Max Actual
Date Received : 8-Jul-09 by: SS - 1 —
Date Extracted: 20-Jul-09 by: AJ 10 13 *
Date Analyzed : 21-Jul-09 by: DAH 60 14 ok
Raw DataFile : g1795

VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-	VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-
103453	Aminomethyl Phosphonic Acid	0.000		1.000		103626	Glufosinate	0.000		1.000	
103452	Glyphosate	0.000		.200							

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
I - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 22-Jul-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
RAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the lab if changes are required. page 1 of 1

SRC Group # 2009-4553

SRC ANALYTICAL

Jun 16, 2009

422 Downey Road
Saskatoon, Saskatchewan, Canada
S7N 4N1
(306) 933-6932 or 1-800-240-8808
Fax: (306) 933-7922

Buffalo Pound Water Admin. Board
P.O. Box 1790
2476 Victoria Avenue
Regina, Saskatchewan S4P 3C8
Attn: Dan Conrad

Sample # **23350**
Date Sampled: **Jun 03, 2009 07:22**
Sample Matrix: **WATER**
Description: **RAW WATER**

Client PO #: **16088**
Date Received: **Jun 04, 2009**

Analyte	Units	Result	DL	Date Entered
Inorganic Chemistry				
Mercury	ug/L	<0.05	0.05	Jun 05, 2009
Aluminum	mg/L	0.055	0.0005	Jun 09, 2009
Arsenic	ug/L	1.0	0.1	Jun 09, 2009
Barium	mg/L	0.068	0.0005	Jun 09, 2009
Boron	mg/L	0.05	0.01	Jun 09, 2009
Cadmium	mg/L	<0.0001	0.0001	Jun 09, 2009
Chromium	mg/L	<0.0005	0.0005	Jun 09, 2009
Copper	mg/L	0.0009	0.0002	Jun 09, 2009
Iron	mg/L	0.016	0.0005	Jun 09, 2009
Lead	mg/L	0.0001	0.0001	Jun 09, 2009
Manganese	mg/L	0.0064	0.0005	Jun 09, 2009
Selenium	mg/L	0.0002	0.0001	Jun 09, 2009
Uranium	ug/L	1.3	0.1	Jun 09, 2009
Zinc	mg/L	0.0083	0.0005	Jun 09, 2009
Total cyanide by S.A.D.	ug/L	<1	1	Jun 12, 2009

"<": not detected at level stated above.

SRC Group # 2009-11109

SRC ANALYTICAL

Dec 09, 2009

422 Downey Road
Saskatoon, Saskatchewan, Canada
S7N 4N1
(306) 933-6932 or 1-800-240-8808
Fax: (306) 933-7922

Buffalo Pound Water Admin. Board
P.O. Box 1790
2476 Victoria Avenue
Regina, Saskatchewan S4P 3C8
Attn: Dan Conrad

Sample # **55234**
Date Sampled: **Nov 24, 2009 07:40**
Sample Matrix: **WATER**
Description: **RAW WATER**

Client PO #: **16088**
Date Received: **Nov 25, 2009**

Analyte	Units	Result	DL
Inorganic Chemistry			
Mercury	ug/L	<0.02	0.02
Aluminum	mg/L	0.040	0.0005
Antimony	mg/L	0.0002	0.0002
Arsenic	ug/L	1.7	0.1
Barium	mg/L	0.062	0.0005
Beryllium	mg/L	<0.0001	0.0001
Boron	mg/L	0.04	0.01
Cadmium	mg/L	<0.00001	0.00001
Chromium	mg/L	<0.0005	0.0005
Cobalt	mg/L	<0.0001	0.0001
Copper	mg/L	0.0009	0.0002
Iron	mg/L	0.011	0.0005
Lead	mg/L	<0.0001	0.0001
Manganese	mg/L	0.0056	0.0005
Molybdenum	mg/L	0.0020	0.0001
Nickel	mg/L	0.0012	0.0001
Selenium	mg/L	0.0001	0.0001
Silver	mg/L	<0.00001	0.00001
Strontium	mg/L	0.28	0.0005
Thallium	mg/L	<0.0002	0.0002
Tin	mg/L	<0.0001	0.0001
Titanium	mg/L	<0.0002	0.0002
Uranium	ug/L	1.2	0.1
Vanadium	mg/L	0.0006	0.0001
Zinc	mg/L	0.0075	0.0005
Total cyanide by S.A.D.	ug/L	<1	1

"<": not detected at level stated above.

SRC Group # 2009-5767

SRC ANALYTICAL

Jul 24, 2009

422 Downey Road
Saskatoon, Saskatchewan, Canada
S7N 4N1
(306) 933-6932 or 1-800-240-8808
Fax: (306) 933-7922

Buffalo Pound Water Admin. Board
P.O. Box 1790
2476 Victoria Avenue
Regina, Saskatchewan S4P 3C8
Attn: Dan Conrad

Sample #	**28787**	Client PO #:	**16088**
Date Sampled:	**Jul 07, 2009 09:33**	Date Received:	**Jul 08, 2009**
Sample Matrix:	**WATER**		
Description:	**RAW WATER**		

Analyte	Units	Result	DL
Organic Chemistry			
Carbaryl	ug/L	<0.1	0.1
Carbofuran	ug/L	<2	2

"<": not detected at level stated above.

EPCOR QUALITY ASSURANCE LABORATORY ANALYTICAL REPORT

Mail:
6th Floor, Capital Square
10065 Jasper Avenue
Edmonton, Alberta
T5J 3B1

Location:
Water Laboratory
Rossdale Water Treatment Plant
9469 Rossdale Road
Edmonton, Alberta
T5K 0A5

Tel: (780) 412-7614
Fax: (780) 412-7717

Submission: 2009-07-28-008 **Date Logged:** 28-Jul-2009 11:05

Results To: DAN CONRAD **Sample Condition:** See Notes Below

Address: BUFFALO POUND
PO BOX 1790
REGINA, SK
S4P 3C8

Tel: (306) 694-1377x3
Fax: (306) 694-6050
Customer PO: 15855
Project ID: BUFFALO POUND DBP
Receiving Temp (Deg Cel): 12

Report ID: VRS CRCB34 08-Sep-2009 15:47

Sample Id	Sample Date	Client ID	Location	Sample Point	Method	Test	Result	Units	Entry Date	Analyst	MDL
BA23376	Sample Condition: COLD,SAMPLE INTACT, DOCUMENTED				Sample Notes:						
BA23376	27-Jul-2009 08:29			PRE GAC	106151	Microcystin	<0.5	ug/L	30-Jul-09	MLAKUSTA	0.5
BA23377	Sample Condition: COLD,SAMPLE INTACT, DOCUMENTED				Sample Notes:						
BA23377	27-Jul-2009 08:08			CW	106151	Microcystin	<0.5	ug/L	30-Jul-09	MLAKUSTA	0.5
BA23378	Sample Condition: COLD,SAMPLE INTACT, DOCUMENTED				Sample Notes:						
BA23378	27-Jul-2009 09:32			RAW WATER	106151	Microcystin	0.5	ug/L	30-Jul-09	MLAKUSTA	0.5

Other Services:

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1786

VOLATILE PRIORITY POLLUTANTS

Contact: MWWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : SRMDWQ GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Clear Well
Matrix : 9
SmpDate: 7-Jul-09 @ 0933 Samplers..ID1 :
EndDate: @ ..ID2 :

METHOD: IE505
SCAN: VPP

TimeLines (days)	from sample date	Max	Actual
Date Received : 8-Jul-09 by: SS		-	1 —
Date Extracted: 15-Jul-09 by: SS		7	8 *
Date Analyzed : 16-Jul-09 by: SS		7	9 *
Raw DataFile : V1786			

VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-
100651	1,1,1,2-Tetrachloroethane	0.0		.1	.1
95224	1,1,2,2-Tetrachloroethane	0.0		.1	.1
95214	1,1-Dichloroethane	0.0		.1	.1
100645	1,1-Dichloropropylene	0.0		.1	.1
100655	1,2,3-Trichloropropane	0.0		.1	.1
100656	1,2,4-Trimethylbenzene	0.0		.1	.1
100641	1,2-Dibromoethane	0.0		.1	.1
95215	1,2-Dichloroethane	0.0		.1	.1
100657	1,3,5-Trimethylbenzene	0.0		.1	.1
100644	1,3-Dichloropropane	0.0		.1	.1
100643	2,2-Dichloropropane	0.0		.1	.1
100638	2-Chlorotoluene	0.0		.1	.1
95200	Benzene	0.0		.1	.1
95201	Bromodichloromethane	.7	H	.1	.1
95203	Bromomethane	0.0		.1	.1
95205	Chlorobenzene	0.0		.1	.1
95208	Chloroform	10.5	H	.1	.2
95209	Dibromochloromethane	.4	H	.1	.1
95221	Ethyl benzene	0.0		.1	.1
100647	Isopropylbenzene	0.0		.1	.1
95222	Methylene chloride	0.0		2.0	.1
95223	Styrene	0.0		.1	.1
95225	Tetrachloroethylene	0.0		.3	.1
100654	Trichloroethylene	0.0		.1	.1
95232	Vinyl chloride	0.0		.5	.1
100642	cis-1,2-Dichloroethylene	0.0		.1	.1
95234	m,p-Xylene	0.0		.1	.1
100650	n-Propylbenzene	0.0		.1	.1
100648	p-Isopropyltoluene	0.0		.1	.1
100636	tert-Butylbenzene	0.0		.1	.1
95220	trans-1,3-Dichloropropylene	0.0		.3	.1

VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-
95227	1,1,1-Trichloroethane	0.0		.1	.1
95228	1,1,2-Trichloroethane	0.0		.1	.1
95216	1,1-Dichloroethylene	0.0		.1	.1
100652	1,2,3-Trichlorobenzene	0.0		.1	.1
100653	1,2,4-Trichlorobenzene	0.0		.1	.1
100640	1,2-Dibromo-3-chloropropane	0.0		.3	.1
95211	1,2-Dichlorobenzene	0.0		.1	.1
95218	1,2-Dichloropropane	0.0		.1	.1
95212	1,3-Dichlorobenzene	0.0		.1	.1
95213	1,4-Dichlorobenzene	0.0		.1	.1
95207	2-Chloroethoxyethylene	0.0		.4	.1
100639	4-Chlorotoluene	0.0		.1	.1
100634	Bromobenzene	0.0		.1	.1
95202	Bromoform	0.0		.5	.1
95204	Carbon tetrachloride	0.0		.1	.1
95206	Chloroethane	0.0		.1	.1
106204	Chloromethane	0.0		.5	.1
95210	Dibromomethane	0.0		.1	.1
100646	Hexachlorobutadiene	0.0		.3	.1
102608	MIBE	0.0		.1	.1
100649	Naphthalene	0.0		.1	.1
100397	TRIHALOMETHANES	11.6	H	.1	.2
95226	Toluene	0.0		.1	.1
95229	Trichlorofluoromethane	0.0		.1	.1
100407	XYLENES	0.0		.1	.1
95219	cis-1,3-Dichloropropylene	0.0		.3	.1
100637	n-Butylbenzene	0.0		.1	.1
95233	o-Xylene	0.0		.1	.1
100635	sec-Butylbenzene	0.0		.1	.1
95217	trans-1,2-Dichloroethylene	0.0		.1	.1

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 16-Jul-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1786

Contact: MWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : SRMDMQ GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Clear Well
Matrix : 9
SmpDate: 7-Jul-09 @ 0933 Samplers..ID1 :
EndDate: @ ..ID2 :

VOLATILE PRIORITY POLLUTANTS
METHOD: IE505
SCAN: VPP

TimeLines (days)		
from sample date	Max	Actual
Date Received : 8-Jul-09 by: SS	-	1 —
Date Extracted: 15-Jul-09 by: SS	7	8 *
Date Analyzed : 16-Jul-09 by: SS	7	9 *

Raw DataFile : V1786

TENTATIVELY IDENTIFIED COMPOUNDS // COMMENTS	ESTIMATED CONCENTRATION
No additional compounds reported	

Laboratory's comments regarding this sample:

The following items regarding the sample were recorded. A Yes notation indicates a problem with the specified item.

Inappropriate Sample Container -
Inappropriate Temperature -
Inappropriate Headspace -
Broken / Leaking Container -

This sample was analyzed by GC/MS. An additional GC/FID scan may have been used for screening purposes and to assist with quantitative data analysis.
Estimated concentrations for tentively identified compounds are calculated assuming an equal response to internal standards.
* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.
** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 16-Jul-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the lab if changes are required.

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1787

Contact: MMWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : SKMDWQ GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Clear Well
Matrix : 9
SmpDate: 7-Jul-09 @ 0933 Samplers..ID1 :
EndDate: @ ..ID2 :

EXTRACTABLE PRIORITY POLLUTANTS
METHOD: IE340
SCAN: EPP

		TimeLines (days) from sample date	
		Max	Actual
Date Received :	8-Jul-09 by: SS	-	1 —
Date Extracted:	16-Jul-09 by: drc	7	9 *
Date Analyzed :	5-Aug-09 by: drc	21	29 *

Raw DataFile : E1787

VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-	VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-
100730	1,2,4-Trichlorobenzene	0.0		.1	.1	100734	1,2-Diphenylhydrazine	0.0		.1	.1
103632	2,3,4,6-Tetrachlorophenol	0.0		.1	.2	100708	2,4,6-Trichlorophenol	0.0		.1	.2
100700	2,4-Dichlorophenol	0.0		.1	.2	100701	2,4-Dimethylphenol	0.0		.2	.2
100703	2,4-Dinitrophenol	0.0		.1	.2	100732	2,4-Dinitrotoluene	0.0		.1	.1
100733	2,6-Dinitrotoluene	0.0		.1	.1	100725	2-Chloronaphthalene	0.0		.1	.1
100699	2-Chlorophenol	0.0		.2	.2	100702	2-Methyl-4,6-dinitrophenol	0.0		.1	.2
100704	2-Nitrophenol	0.0		.1	.2	100738	4-Bromophenyl phenyl ether	0.0		.1	.1
100698	4-Chloro-3-methylphenol	0.0		.1	.2	100742	4-Chlorophenyl phenyl ether	0.0		.1	.1
100705	4-Nitrophenol	0.0		.1	.2	100709	Acenaphthene	0.0		.1	.1
100710	Acenaphthylene	0.0		.1	.1	100711	Anthracene	0.0		.1	.1
100731	Benzidine	0.0		.2	.2	100712	Benzo(a)anthracene	0.0		.1	.1
100716	Benzo(a)pyrene	0.0		.1	.2	100713	Benzo(b)fluoranthene	0.0		.1	.1
100715	Benzo(ghi)perylene	0.0		.2	.1	100714	Benzo(k)fluoranthene	0.0		.1	.1
100739	Bis(2-chloroethoxy)methane	0.0		.1	.1	100740	Bis(2-chloroethyl)ether	0.0		.1	.1
100741	Bis(2-chloroisopropyl)ether	0.0		.1	.1	100748	Bis(2-ethylhexyl)phthalate	.5	H	.1	.1
100743	Butylbenzylphthalate	0.0		.1	.1	100717	Chrysene	0.0		.1	.1
100744	Di-n-butylphthalate	.1	HX	.1	.1	100747	Di-n-octyl phthalate	0.0		.1	.1
100718	Dibenzo(ah)anthracene	0.0		.5	.1	100745	Diethyl phthalate	0.0		.1	.1
100746	Dimethyl phthalate	0.0		.1	.1	100719	Fluoranthene	0.0		.1	.1
100720	Fluorene	0.0		.1	.1	100726	Hexachlorobenzene	0.0		.1	.1
100727	Hexachlorobutadiene	0.0		.5	.1	100728	Hexachlorocyclopentadiene	0.0		.1	.1
100729	Hexachloroethane	0.0		.5	.1	100721	Indeno(1,2,3-cd)pyrene	0.0		.1	.1
100749	Isophorone	0.0		.1	.1	100737	N-Nitroso-di-n-propylamine	0.0		.2	.1
100736	N-Nitrosodiphenylamine	0.0		.1	.1	100722	Naphthalene	0.0		.1	.1
100735	Nitrobenzene	0.0		.1	.1	100706	Pentachlorophenol	0.0		.1	.2
100723	Phenanthrene	0.0		.1	.1	100707	Phenol	0.0		.1	.2
100724	Pyrene	0.0		.1	.1						

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
I - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 6-Aug-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MMWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the lab if changes are required. page 1 of 2

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1787

Contact: MWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : SRMDWQ GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Clear Well
Matrix : 9
SmpDate: 7-Jul-09 @ 0933 Samplers..ID1 :
EndDate: @ ..ID2 :

EXTRACTABLE PRIORITY POLLUTANTS
METHOD: IE340 | SCAN: EPP |

TimeLines (days) from sample date	Max	Actual	
Date Received : 8-Jul-09 by: SS	-	1	—
Date Extracted: 16-Jul-09 by: drc	7	9	*
Date Analyzed : 5-Aug-09 by: drc	21	29	*

Raw DataFile : E1787

TENTATIVELY IDENTIFIED COMPOUNDS // COMMENTS	ESTIMATED CONCENTRATION
No additional compounds reported	

Laboratory's comments regarding this sample:

The following items regarding the sample were recorded. A Yes notation indicates a problem with the specified item.

Inappropriate Sample Container -
Inappropriate Temperature -
Inappropriate Headspace -
Broken / Leaking Container -

This sample was analyzed by GC/MS. An additional GC/FID scan may have been used for screening purposes and to assist with quantitative data analysis.
Estimated concentrations for tentively identified compounds are calculated assuming an equal response to internal standards.
* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.
** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 6-Aug-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the lab if changes are required.

page 2 of 2

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1788

PESTICIDE ANALYSIS

Contact: MWWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : SKMDWQ GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Clear Well
Matrix : 9
SmpDate: 7-Jul-09 @ 0933 Samplers..ID1 :
EndDate: @ ..ID2 :

METHOD: EM443
SCAN: PESTE

TimeLines (days)		
from sample date	Max	Actual
Date Received : 8-Jul-09 by: SS	-	1 —
Date Extracted: 8-Jul-09 by: ARJ	10	1 ok
Date Analyzed : 13-Jul-09 by: ARJ	20	6 ok

Raw DataFile : p1788

VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-	VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-
100667	2,4-D	0.000		.005	.002	100668	2,4-DB	0.000		.005	.002
100669	2,4-DP	0.000		.005	.002	99888	2,4-dichlorophenol	0.000		.010	.004
99887	4-chloro-2-methylphenol	0.000		.010	.004	97938	Aldicarb	0.000		.100	.020
102929	Aldrin	0.000		.005	.002	106769	Aminopyralid	0.000		.010	.003
100674	Atrazine	0.000		.005	.002	99897	Bentazon	0.000		.005	.002
100675	Bromacil	0.000		.030	.004	100676	Bromoxynil	0.000		.005	.002
100677	Carbathiin (Carboxin)	0.000		.100	.020	99889	Chlorothalonil	0.000		.005	.002
100684	Chlorpyrifos (Dursban)	0.000		.005	.002	99881	Clodinafop acid metabolite	0.000		.020	.004
99880	Clodinafop-propargyl	0.000		.040	.056	100688	Clopyralid (Lontrel)	0.000		.020	.004
100678	Cyanazine	0.000		.050	.008	102609	Desethyl atrazine	0.000		.050	.008
102610	Desisopropyl atrazine	0.000		.050	.008	100679	Diazinon	0.000		.005	.002
103639	Dicamba (Banvel)	0.000		.005	.002	100681	Diclofop-methyl (Hoe Grass)	0.000		.020	.004
102930	Dieldrin	0.000		.005	.002	102618	Dimethoate (Cygon)	0.000		.050	.007
100682	Disulfoton (Di-Syston)	0.000		.200	.050	100683	Diuron	0.000		.200	.250
100685	Ethalfluralin (Edge)	0.000		.005	.002	100686	Ethion	0.000		.100	.020
99898	Ethofumesate	0.000		.005	.002	102613	Fenoxaprop-P-ethyl	0.000		.040	.008
99894	Fluazifop	0.000		.010	.004	99895	Fluroxypyr	0.000		.010	.004
100687	Guthion	0.000		.200	.020	99892	Hexaconazole	0.000		.050	.008
102088	Imazamethabenz-methyl(Assert)	0.000		.050	.044	103141	Imazamox	0.000		.020	.002
102612	Imazethapyr	0.000		.020	.004	99890	Iprodione	0.000		.020	.004
99899	Linuron	0.000		.020	.004	100690	MCPA	0.000		.005	.002
100691	MCPB	0.000		.020	.004	100692	MCPP (Mecoprop)	0.000		.005	.002
100689	Malathion	0.000		.050	.008	99893	Metalaxyl-M	0.000		.010	.004
97934	Methomyl	0.000		.100	.020	102935	Metolachlor	0.000		.005	.002
103631	Metribuzin	0.000		.010	.004	74365	Napropamide	0.000		.020	.004
97933	Oxycarboxin	0.000		.050	.008	103630	Parathion	0.000		.010	.004
100694	Phorate (Thimet)	0.000		.005	.002	100693	Picloram (Tordon)	0.000		.005	.002

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 14-Jul-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the lab if changes are required. page 1 of 1

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1788

Contact: MWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : SKMDWQ GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Clear Well
Matrix : 9
SmpDate: 7-Jul-09 @ 0933 Samplers..ID1 :
EndDate: @ ..ID2 :

PESTICIDE ANALYSIS
METHOD: EM443 | TimeLines (days)
SCAN: PESTE | from sample date
| Max Actual
Date Received : 8-Jul-09 by: SS - 1
Date Extracted: 8-Jul-09 by: ARJ 10 1 ok
Date Analyzed : 13-Jul-09 by: ARJ 20 6 ok
Raw DataFile : p1788

VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-	VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-
99891	Propiconazole	0.000		.050	.008	102614	Pyridaben	0.000		.020	.004
102611	Quinclorac	0.000		.005	.002	99896	Quizalofop	0.000		.030	.004
103824	Simazine	0.000		.010	.004	100695	Terbufos	0.000		.030	.004
74474	Thiamethoxam	0.000		.050	.008	100696	Triallate (Avadex BW)	0.000		.005	.002
103825	Triclopyr	0.000		.010	.004	100697	Trifluralin (Treflan)	0.000		.005	.002
97932	Vinclozolin	0.000		.010	.004	100670	alpha-BHC	0.000		.005	.002
100671	alpha-Endosulfan	0.000		.005	.002	100672	gamma-BHC (Lindane)	0.000		.005	.002
100673	p,p-Methoxychlor	0.000		.030	.004						

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 14-Jul-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the lab if changes are required. page 1 of 1

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1789

Contact: MWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : SKMDMQ GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Clear Well
Matrix : 9
SmpDate: 7-Jul-09 @ 0933 Samplers..ID1 :
EndDate: @ ..ID2 :

POLYCYCLIC AROMATIC HYDROCARBONS
METHOD: - - -
SCAN: PAH

	Timelines (days) from sample date	
	Max	Actual
Date Received : 8-Jul-09 by: SS	-	1 —
Date Extracted: 24-Jul-09 by: rmr	11	17 *
Date Analyzed : 24-Jul-09 by: rmr	21	17 ok

Raw DataFile : P1789

GC/MSD SIM DATA

VMV_CODE	COMPOUND NAME	ug/L	MDL flag	VMV_CODE	COMPOUND NAME	ug/L	MDL flag
103142	3-Methylchloranthrene	0.00	.01	103143	7,12-Dimethylbenz(a)anthracen	0.00	.01
103144	Acenaphthene	0.00	.01	103145	Acenaphthylene	0.00	.01
103146	Acridine	0.00	.01	103147	Anthracene	0.00	.01
103148	Benzo(a)anthracene	0.00	.01	103149	Benzo(a)pyrene	0.00	.01
103150	Benzo(b,j,k)fluoranthene	0.00	.01	103151	Benzo(c)phenanthrene	0.00	.01
103152	Benzo(e)pyrene	0.00	.01	103153	Benzo(ghi)perylene	0.00	.01
103154	Chrysene	0.00	.01	103155	Dibenzo(a,h)pyrene	0.00	.01
103156	Dibenzo(a,i)pyrene	0.00	.01	103157	Dibenzo(a,l)pyrene	0.00	.01
103158	Dibenzo(ah)anthracene	0.00	.01	103159	Fluoranthene	0.00	.01
103160	Fluorene	0.00	.01	103161	Indeno(1,2,3-cd)pyrene	0.00	.01
103162	Naphthalene	0.00	.01	107132	Perylene	0.00	.01
103163	Phenanthrene	0.00	.01	103164	Pyrene	0.00	.01
103761	Retene	0.00	.01				

ARC Remarks:

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 5-Aug-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the lab if changes are required. page 1 of 1

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1790

GLYPHOSATE, AMPA AND GLUFOSINATE

Contact: MWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : SKMDWQ GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Clear Well
Matrix : 9
SmpDate: 7-Jul-09 @ 0933 Samplers..ID1 :
EndDate: @ ..ID2 :

METHOD: EC/16 | TimeLines (days)
SCAN: GLYPH | from sample date
| Max Actual
Date Received : 8-Jul-09 by: SS - 1 —
Date Extracted: 20-Jul-09 by: AJ 10 13 *
Date Analyzed : 21-Jul-09 by: DAH 60 14 ok
Raw DataFile : g1790

VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-	VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-
103453	Aminomethyl Phosphonic Acid	0.000		1.000		103626	Glufosinate	0.000		1.000	
103452	Glyphosate	0.000		.200							

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 22-Jul-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the lab if changes are required. page 1 of 1

SRC Group # 2009-4552

SRC ANALYTICAL

Jun 16, 2009

422 Downey Road
Saskatoon, Saskatchewan, Canada
S7N 4N1
(306) 933-6932 or 1-800-240-8808
Fax: (306) 933-7922

Buffalo Pound Water Admin. Board
P.O. Box 1790
2476 Victoria Avenue
Regina, Saskatchewan S4P 3C8
Attn: Dan Conrad

Sample # **23319**
Date Sampled: **Jun 03, 2009 08:05**
Sample Matrix: **WATER**
Description: **CLEARWELL**

Client PO #: **16088**
Date Received: **Jun 04, 2009**

Analyte	Units	Result	DL	Date Entered
Inorganic Chemistry				
Mercury	ug/L	<0.05	0.05	Jun 05, 2009
Aluminum	mg/L	0.027	0.0005	Jun 09, 2009
Arsenic	ug/L	0.4	0.1	Jun 09, 2009
Barium	mg/L	0.063	0.0005	Jun 09, 2009
Boron	mg/L	0.03	0.01	Jun 09, 2009
Cadmium	mg/L	<0.0001	0.0001	Jun 09, 2009
Chromium	mg/L	<0.0005	0.0005	Jun 09, 2009
Copper	mg/L	<0.0002	0.0002	Jun 09, 2009
Iron	mg/L	0.0008	0.0005	Jun 09, 2009
Lead	mg/L	<0.0001	0.0001	Jun 09, 2009
Manganese	mg/L	<0.0005	0.0005	Jun 09, 2009
Selenium	mg/L	0.0002	0.0001	Jun 09, 2009
Uranium	ug/L	0.9	0.1	Jun 09, 2009
Zinc	mg/L	<0.0005	0.0005	Jun 09, 2009
Total cyanide by S.A.D.	ug/L	<1	1	Jun 12, 2009

"<": not detected at level stated above.

SRC Group # 2009-5766

SRC ANALYTICAL

Jul 24, 2009

422 Downey Road
Saskatoon, Saskatchewan, Canada
S7N 4N1
(306) 933-6932 or 1-800-240-8808
Fax: (306) 933-7922

Buffalo Pound Water Admin. Board
P.O. Box 1790
2476 Victoria Avenue
Regina, Saskatchewan S4P 3C8
Attn: Dan Conrad

Sample # **28788**
Date Sampled: **Jul 07, 2009 09:33**
Sample Matrix: **WATER**
Description: **CLEARWELL**

Client PO #: **16088**
Date Received: **Jul 08, 2009**

Analyte	Units	Result	DL
Organic Chemistry			
Carbaryl	ug/L	<0.1	0.1
Carbofuran	ug/L	<2	2

"<": not detected at level stated above.

SRC Group # 2009-9345

SRC ANALYTICAL

Oct 22, 2009

422 Downey Road
Saskatoon, Saskatchewan, Canada
S7N 4N1
(306) 933-6932 or 1-800-240-8808
Fax: (306) 933-7922

Buffalo Pound Water Admin. Board
P.O. Box 1790
2476 Victoria Avenue
Regina, Saskatchewan S4P 3C8
Attn: Dan Conrad

Sample # **45904**
Date Sampled: **Oct 06, 2009 07:50**
Sample Matrix: **WATER**
Description: **PREGAC**

Client PO #: **16088**
Date Received: **Oct 07, 2009**

Analyte	Units	Result	DL
Organic Chemistry			
Monochloroacetic acid	ug/L	<5	5
Monobromoacetic acid	ug/L	2	1
Dichloroacetic acid	ug/L	10	0.5
Trichloroacetic acid	ug/L	8.5	1
Dibromoacetic acid	ug/L	2.5	0.5
Halo Acetic Acids 5, Total (calc.)	ug/L	23	5
Bromochloroacetic acid	ug/L	3.7	0.5

"<": not detected at level stated above.

SRC Group # 2009-478

SRC ANALYTICAL

Feb 10, 2009

422 Downey Road
Saskatoon, Saskatchewan, Canada
S7N 4N1
(306) 933-6932 or 1-800-240-8808
Fax: (306) 933-7922

Buffalo Pound Water Admin. Board
P.O. Box 1790
2476 Victoria Avenue
Regina, Saskatchewan S4P 3C8
Attn: Dan Conrad

Sample # **2338**
Date Sampled: **Jan 19, 2009**
Sample Matrix: **WATER**
Description: **BPWTP CW (IN DUP)**

Client PO #: **16088**
Date Received: **Jan 20, 2009**

Analyte	Units	Result	DL	Date Entered
Organic Chemistry				
Monochloroacetic acid	ug/L	<5	5	Feb 06, 2009
Monobromoacetic acid	ug/L	5	1	Feb 06, 2009
Dichloroacetic acid	ug/L	14	0.5	Feb 06, 2009
Trichloroacetic acid	ug/L	16	1	Feb 06, 2009
Dibromoacetic acid	ug/L	3.5	0.5	Feb 06, 2009
Halo Acetic Acids 5, Total (calc.)	ug/L	39	5	Feb 06, 2009
Bromochloroacetic acid	ug/L	4.4	0.5	Feb 06, 2009

"<": not detected at level stated above.

HAA-5 total does not include Bromochloroacetic acid.

SRC Group # 2009-2721

SRC ANALYTICAL

Apr 27, 2009

422 Downey Road
Saskatoon, Saskatchewan, Canada
S7N 4N1
(306) 933-6932 or 1-800-240-8808
Fax: (306) 933-7922

Buffalo Pound Water Admin. Board
P.O. Box 1790
2476 Victoria Avenue
Regina, Saskatchewan S4P 3C8
Attn: Dan Conrad

Sample # **12631**
Date Sampled: **Apr 08, 2009 08:30**
Sample Matrix: **WATER**
Description: **CLEARWELL**

Client PO #: **16088**
Date Received: **Apr 09, 2009**

Analyte	Units	Result	DL
Organic Chemistry			
Monochloroacetic acid	ug/L	<5	5
Monobromoacetic acid	ug/L	4.0	1
Dichloroacetic acid	ug/L	18	0.5
Trichloroacetic acid	ug/L	19	1
Dibromoacetic acid	ug/L	2.6	0.5
Halo Acetic Acids 5, Total (calc.)	ug/L	43.6	5
Bromochloroacetic acid	ug/L	5.7	0.5

"<": not detected at level stated above.

We noticed the di and trichloroacetic acid results are significantly higher than the fall analysis of the same Clearwater sample although everything looks fine with this sample. If you want it repeated we have another vial to do that.

SRC Group # 2009-5764

SRC ANALYTICAL

Jul 21, 2009

422 Downey Road
Saskatoon, Saskatchewan, Canada
S7N 4N1
(306) 933-6932 or 1-800-240-8808
Fax: (306) 933-7922

Buffalo Pound Water Admin. Board
P.O. Box 1790
2476 Victoria Avenue
Regina, Saskatchewan S4P 3C8
Attn: Dan Conrad

Sample # **28801**
Date Sampled: **Jul 07, 2009 09:33**
Sample Matrix: **WATER**
Description: **CLEARWELL**

Client PO #: **16088**
Date Received: **Jul 08, 2009**

Analyte	Units	Result	DL
Organic Chemistry			
Monochloroacetic acid	ug/L	<5	5
Monobromoacetic acid	ug/L	1	1
Dichloroacetic acid	ug/L	2	0.5
Trichloroacetic acid	ug/L	2.5	1
Dibromoacetic acid	ug/L	2	0.5
Halo Acetic Acids 5, Total (calc.)	ug/L	<10	5
Bromochloroacetic acid	ug/L	2	0.5

"<": not detected at level stated above.

SRC Group # 2009-9344

SRC ANALYTICAL

Oct 22, 2009

422 Downey Road
Saskatoon, Saskatchewan, Canada
S7N 4N1
(306) 933-6932 or 1-800-240-8808
Fax: (306) 933-7922

Buffalo Pound Water Admin. Board
P.O. Box 1790
2476 Victoria Avenue
Regina, Saskatchewan S4P 3C8
Attn: Dan Conrad

Sample # **45903**
Date Sampled: **Oct 06, 2009 08:15**
Sample Matrix: **WATER**
Description: **CLEARWELL**

Client PO #: **16088**
Date Received: **Oct 07, 2009**

Analyte	Units	Result	DL
Organic Chemistry			
Monochloroacetic acid	ug/L	<5	5
Monobromoacetic acid	ug/L	1	1
Dichloroacetic acid	ug/L	<0.5	0.5
Trichloroacetic acid	ug/L	<1	1
Dibromoacetic acid	ug/L	2	0.5
Halo Acetic Acids 5, Total (calc.)	ug/L	<10	5
Bromochloroacetic acid	ug/L	2	0.5

"<": not detected at level stated above.

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-3041

Contact: MMWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : GrpSmpNo :
StaNo : StaType:
Comment: Site 2 Qu'Appelle Dam
Matrix :
SmpDate: 21-Sep-09 @ Samplers..ID1 :
EndDate: @ ..ID2 :

Acidic Drug Residues
METHOD: EM443 | TimeLines (days)
SCAN: DRUGA | from sample date
| Max Actual
Date Received : 23-Sep-09 by: SS - 2 —
Date Extracted: 30-Sep-09 by: ARJ 10 9 ok
Date Analyzed : 7-Oct-09 by: ARJ 20 16 ok
Raw DataFile : d3041

VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-	VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-
80343	3,4,4-Trichlorocarbanilide	0.000		.025	.006	74352	Acetylsalicylic acid	0.000		.010	.003
74361	Bezafibrate	0.000		.100	.015	97939	Caffeine	0.000		.020	.001
74363	Carbamazepine	0.000		.010	.003	74354	Clofibric acid	0.000		.010	.003
74360	Diclofenac	0.000		.010	.003	74357	Fenoprofen	0.000		.005	.001
74356	Gemfibrozil	0.000		.005	.001	74355	Ibuprofen	0.000		.005	.001
74362	Indomethacin	0.000		.050	.038	74359	Ketoprofen	0.000		.010	.003
80368	Meclofenamic acid	0.000		.010	.003	80342	Methyl Triclosan	0.000		.010	.003
80344	N,N-diethyl-m-toluamide (DEET)	0.000		.005	.001	74358	Naproxen	0.000		.005	.001
74353	Salicylic acid	0.000		.025	.006	80275	Tolfenamic acid	0.000		.005	.001
80341	Triclosan	0.000		.025	.006						

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-3042

Contact: MWWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : GrpSmpNo :
StaNo : StaType:
Comment: Site 2 Qu'Appelle Dam
Matrix :
SmpDate: 21-Sep-09 @ Samplers..ID1 :
EndDate: @ 30-SEP-200 ..ID2 :

Neutral Drug Residues
METHOD: 1883 | TimeLines (days)
SCAN: DRUGN | from sample date
| Max Actual
Date Received : 23-Sep-09 by: SS - 2 —
Date Extracted: 30-Sep-09 by: KLS 10 9 ok
Date Analyzed : 30-Sep-09 by: KLS 50 9 ok
Raw DataFile : D3042

VMV_CODE	COMPOUND NAME	ppb	flag	MDL	+\-	VMV_CODE	COMPOUND NAME	ppb	flag	MDL	+\-
80271	Acetaminophen	0.000		.05		106163	Benzoylecgonine	0.000		.01	
80293	Chloramphenicol	0.000		.01		80283	Ciprofloxacin	0.000		.02	
80294	Clindamycin	0.000		.01		107667	Cocaine	0.000		.01	
106272	Codeine	0.000		.05		80280	Cotinine	.010	H	.01	
80284	Enrofloxacin	0.000		.02		80295	Erythromycin	0.000		.01	
80285	Fluoxetine	0.000		.01		80270	Lincomycin	0.000		.05	
80282	Methamphetamine	0.000		.02		80286	Norfloxacin	0.000		.02	
80287	Norfluoxetine	0.000		.02		80288	Ofloxacin	0.000		.02	
80289	Orolinic Acid	0.000		.01		80290	Pentoxifylline	0.000		.50	
80291	Pipemidic Acid	0.000		.50		107265	Sulfabenzamide	0.000		.05	
107266	Sulfadimethoxine	0.000		.05		107267	Sulfadoxine	0.000		.05	
107268	Sulfamerazine	0.000		.05		106270	Sulfamethazine	0.000		.05	
106271	Sulfamethoxazole	0.000		.05		107269	Sulfapyridine	0.000		.05	
107270	Sulfaquinoxaline	0.000		.05		107271	Sulfathiazole	0.000		.05	
80292	Trimethoprim	0.000		.02							

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 2-Oct-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the lab if changes are required. page 1 of 1

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-3043

Contact: MWWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : GrpSmpNo :
StaNo : StaType:
Comment: Site 5 Marquis
Matrix :
SmpDate: 21-Sep-09 @ Samplers..ID1 :
EndDate: @ ..ID2 :

Acidic Drug Residues
METHOD: EM443
SCAN: DRUGA

TimeLines (days)	Max	Actual
from sample date		
Date Received : 23-Sep-09 by: SS	-	2 —
Date Extracted: 30-Sep-09 by: ARJ	10	9 ok
Date Analyzed : 8-Oct-09 by: ARJ	20	17 ok

Raw DataFile : d3043

VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-
80343	3,4,4-Trichlorocarbanilide	0.000		.025	.006
74361	Bezafibrate	0.000		.100	.015
74363	Carbamazepine	0.000		.010	.003
74360	Diclofenac	0.000		.010	.003
74356	Gemfibrozil	0.000		.005	.001
74362	Indomethacin	0.000		.050	.038
80368	Meclofenamic acid	0.000		.010	.003
80344	N,N-diethyl-m-toluamide (DEET)	0.000		.005	.001
74353	Salicylic acid	0.000		.025	.006
80341	Triclosan	0.000		.025	.006
74352	Acetylsalicylic acid	0.000		.010	.003
97939	Caffeine	0.000		.020	.001
74354	Clofibric acid	0.000		.010	.003
74357	Fenoprofen	0.000		.005	.001
74355	Ibuprofen	0.000		.005	.001
74359	Ketoprofen	0.000		.010	.003
80342	Methyl Triclosan	0.000		.010	.003
74358	Naproxen	0.000		.005	.001
80275	Tolfenamic acid	0.000		.005	.001

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 16-Oct-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the lab if changes are required. page 1 of 1

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-3044

Contact: MMWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : GrpSmpNo :
StaNo : StaType:
Comment: Site 5 Marquis
Matrix :
SmpDate: 21-Sep-09 @ Samplers..ID1 :
EndDate: @ 30-SEP-200 ..ID2 :

Neutral Drug Residues
METHOD: 1883
SCAN: DRUGN

TimeLines (days)	from sample date	Max	Actual
Date Received : 23-Sep-09 by: SS		-	2 —
Date Extracted: 30-Sep-09 by: KLS		10	9 ok
Date Analyzed : 30-Sep-09 by: KLS		50	9 ok
Raw DataFile : D3044			

VMV_CODE	COMPOUND NAME	ppb	flag	MDL	+\-
80271	Acetaminophen	0.000		.05	
80293	Chloramphenicol	0.000		.01	
80294	Clindamycin	0.000		.01	
106272	Codeine	0.000		.05	
80284	Enrofloxacin	0.000		.02	
80285	Fluoxetine	0.000		.01	
80282	Methamphetamine	0.000		.02	
80287	Norfluoxetine	0.000		.02	
80289	Oxolinic Acid	0.000		.01	
80291	Pipemidic Acid	0.000		.50	
107266	Sulfadimethoxine	0.000		.05	
107268	Sulfamerazine	0.000		.05	
106271	Sulfamethoxazole	0.000		.05	
107270	Sulfaquinoxaline	0.000		.05	
80292	Trimethoprim	0.000		.02	

VMV_CODE	COMPOUND NAME	ppb	flag	MDL	+\-
106163	Benzoylecgonine	0.000		.01	
80283	Ciprofloxacin	0.000		.02	
107667	Cocaine	0.000		.01	
80280	Cotinine	.010	H	.01	
80295	Erythromycin	0.000		.01	
80270	Lincomycin	0.000		.05	
80286	Norfloxacin	0.000		.02	
80288	Ofloxacin	0.000		.02	
80290	Pentoxifylline	0.000		.50	
107265	Sulfabenzamide	0.000		.05	
107267	Sulfadoxine	0.000		.05	
106270	Sulfamethazine	0.000		.05	
107269	Sulfapyridine	0.000		.05	
107271	Sulfathiazole	0.000		.05	

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 2-Oct-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MMWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the Lab if changes are required. page 1 of 1

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-3045

Contact: MWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : GrpSmpNo :
StaNo : StaType:
Comment: Site 7 Raw Water
Matrix :
SmpDate: 22-Sep-09 @ Samplers..ID1 :
EndDate: @ ..ID2 :

Acidic Drug Residues
METHOD: EM443 | SCAN: DRUGA |

TimeLines (days) from sample date	Max	Actual
Date Received : 23-Sep-09 by: SS	-	1 —
Date Extracted: 30-Sep-09 by: ARJ	10	8 ok
Date Analyzed : 8-Oct-09 by: ARJ	20	16 ok

Raw DataFile : d3045

VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-	VMV_CODE	COMPOUND NAME	ug/L	flag	MDL	+\-
80343	3,4,4-Trichlorocarbanilide	0.000		.025	.006	74352	Acetylsalicylic acid	0.000		.010	.003
74361	Bezafibrate	0.000		.100	.015	97939	Caffeine	0.000		.020	.001
74363	Carbamazepine	0.000		.010	.003	74354	Clofibric acid	0.000		.010	.003
74360	Diclofenac	0.000		.010	.003	74357	Fenoprofen	0.000		.005	.001
74356	Gemfibrozil	0.000		.005	.001	74355	Ibuprofen	0.000		.005	.001
74362	Indomethacin	0.000		.050	.038	74359	Ketoprofen	0.000		.010	.003
80368	Meclofenamic acid	0.000		.010	.003	80342	Methyl Triclosan	0.000		.010	.003
80344	N,N-diethyl-m-toluamide (DEET)	0.000		.005	.001	74358	Naproxen	0.000		.005	.001
74353	Salicylic acid	0.000		.025	.006	80275	Tolfenamic acid	0.000		.005	.001
80341	Triclosan	0.000		.025	.006						

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 16-Oct-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the lab if changes are required. page 1 of 1

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-3046

Contact: MWWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : GrpSmpNo :
StaNo : StaType:
Comment: Site 7 Raw Water
Matrix :
SmpDate: 22-Sep-09 @ Samplers..ID1 :
EndDate: @ 30-SEP-200 ..ID2 :

Neutral Drug Residues
METHOD: 1883 | TimeLines (days)
SCAN: DRUGN | from sample date
| Max Actual
Date Received : 23-Sep-09 by: SS - 1 —
Date Extracted: 30-Sep-09 by: KLS 10 8 ok
Date Analyzed : 30-Sep-09 by: KLS 50 8 ok
Raw DataFile : D3046

VMV_CODE	COMPOUND NAME	ppb	flag	MDL	+\-	VMV_CODE	COMPOUND NAME	ppb	flag	MDL	+\-
80271	Acetaminophen	0.000		.05		106163	Benzoylecgonine	0.000		.01	
80293	Chloramphenicol	0.000		.01		80283	Ciprofloxacin	0.000		.02	
80294	Clindamycin	0.000		.01		107667	Cocaine	0.000		.01	
106272	Codeine	0.000		.05		80280	Cotinine	.010	H	.01	
80284	Enrofloxacin	0.000		.02		80295	Erythromycin	0.000		.01	
80285	Fluoxetine	0.000		.01		80270	Lincomycin	0.000		.05	
80282	Methamphetamine	0.000		.02		80286	Norfloxacin	0.000		.02	
80287	Norfluoxetine	0.000		.02		80288	Ofloxacin	0.000		.02	
80289	Oxolinic Acid	0.000		.01		80290	Pentoxifylline	0.000		.50	
80291	Pipemidic Acid	0.000		.50		107265	Sulfabenzamide	0.000		.05	
107266	Sulfadimethoxine	0.000		.05		107267	Sulfadoxine	0.000		.05	
107268	Sulfamerazine	0.000		.05		106270	Sulfamethazine	0.000		.05	
106271	Sulfamethoxazole	0.000		.05		107269	Sulfapyridine	0.000		.05	
107270	Sulfaquinoxaline	0.000		.05		107271	Sulfathiazole	0.000		.05	
80292	Trimethoprim	0.000		.02							

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 2-Oct-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

"results relate only to the item tested"

Please check the mailing information and inform the lab if changes are required. page 1 of 1

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1043

Contact: MWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Site 2 Qu'Appelle Dam
Matrix : 9
SmpDate: 20-Apr-09 @ 1200 Samplers..ID1 :
EndDate: @ ..ID2 :

Acidic Drug Residues
METHOD: 1883
SCAN: DRUGA

TimeLines (days)		
from sample date	Max	Actual
Date Received : 22-Apr-09 by: SS	-	2 —
Date Extracted: 28-Apr-09 by: ARJ	10	8 ok
Date Analyzed : 1-May-09 by: ARJ	20	11 ok

Raw DataFile : D1043

VMV_CODE	COMPOUND NAME	ug/g	flag	MDL	+\-
80343	3,4,4-Trichlorocarbanilide	0.000		.025	.006
74361	Bezafibrate	0.000		.100	.015
74363	Carbamazepine	0.000		.010	.003
74360	Diclofenac	0.000		.010	.003
74356	Gemfibrozil	0.000		.005	.001
74362	Indomethacin	0.000		.050	.038
80368	Meclofenamic acid	0.000		.010	.003
80344	N,N-diethyl-m-toluamide (DEET)	0.000		.005	.001
74353	Salicylic acid	0.000		.025	.006
80341	Triclosan	0.000		.025	.006
74352	Acetylsalicylic acid	0.000		.010	.003
97939	Caffeine	0.000		.020	.001
74354	Clofibric acid	0.000		.010	.003
74357	Fenoprofen	0.000		.005	.001
74355	Ibuprofen	0.000		.005	.001
74359	Ketoprofen	0.000		.010	.003
80342	Methyl Triclosan	0.000		.010	.003
74358	Naproxen	0.000		.005	.001
80275	Tolfenamic acid	0.000		.005	.001

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 6-May-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

If there are any questions or concerns regarding this report, please contact the person indicated above.
Please check the mailing information and inform the lab if changes are required. page 1 of 1

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1044

Contact: MWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Site 2 Qu'Appelle Dam
Matrix : 9
SmpDate: 20-Apr-09 @ 1200 Samplers..ID1 :
EndDate: @ 30-APR-200 ..ID2 :

Neutral Drug Residues
METHOD: 1883
SCAN: DRUGN

TimeLines (days)		
from sample date	Max	Actual
Date Received : 22-Apr-09 by: SS	-	2 —
Date Extracted: 30-Apr-09 by: kls	10	10 ok
Date Analyzed : 30-Apr-09 by: kls	50	10 ok

Raw DataFile : D1044

VMV_CODE	COMPOUND NAME	ppb	flag	MDL	+\-
80271	Acetaminophen	0.000		.05	
80293	Chloramphenicol	0.000		.01	
80294	Clindamycin	0.000		.01	
80280	Cotinine	.010	H	.01	
80295	Erythromycin	0.000		.01	
80270	Lincomycin	0.000		.05	
80286	Norfloxacin	0.000		.02	
80288	Ofloxacin	0.000		.02	
80290	Pentoxifylline	0.000		.50	
107265	Sulfabenzamide	0.000		.05	
107267	Sulfadoxine	0.000		.05	
106270	Sulfamethazine	0.000		.05	
107269	Sulfapyridine	0.000		.05	
107271	Sulfathiazole	0.000		.05	

VMV_CODE	COMPOUND NAME	ppb	flag	MDL	+\-
106163	Benzoylecgonine	0.000		.01	
80283	Ciprofloxacin	0.000		.02	
106272	Codeine	0.000		.05	
80284	Enrofloxacin	0.000		.02	
80285	Fluoxetine	0.000		.01	
80282	Methamphetamine	0.000		.02	
80287	Norfluoxetine	0.000		.02	
80289	Oxolinic Acid	0.000		.01	
80291	Pipemidic Acid	0.000		.50	
107266	Sulfadimethoxine	0.000		.05	
107268	Sulfamerazine	0.000		.05	
106271	Sulfamethoxazole	0.000		.05	
107270	Sulfaquinoxaline	0.000		.05	
80292	Trimethoprim	0.000		.02	

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 13-May-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

If there are any questions or concerns regarding this report, please contact the person indicated above.
Please check the mailing information and inform the lab if changes are required. page 1 of 1

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1045

Contact: MMMS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Site 5 Marquis
Matrix : 9
SmpDate: 20-Apr-09 @ 0845 Samplers..ID1 :
EndDate: @ ..ID2 :

Acidic Drug Residues
METHOD: 1883
SCAN: DRUGA

TimeLines (days)		
from sample date		
	Max	Actual
Date Received : 22-Apr-09 by: SS	-	2 —
Date Extracted: 28-Apr-09 by: ARJ	10	8 ok
Date Analyzed : 2-May-09 by: ARJ	20	12 ok

Raw DataFile : D1045

VMV_CODE	COMPOUND NAME	ug/g	flag	MDL	+\-	VMV_CODE	COMPOUND NAME	ug/g	flag	MDL	+\-
80343	3,4,4-Trichlorocarbanilide	0.000		.025	.006	74352	Acetylsalicylic acid	0.000		.010	.003
74361	Bezafibrate	0.000		.100	.015	97939	Caffeine	0.000		.020	.001
74363	Carbamazepine	0.000		.010	.003	74354	Clofibric acid	0.000		.010	.003
74360	Diclofenac	0.000		.010	.003	74357	Fenoprofen	0.000		.005	.001
74356	Gemfibrozil	0.000		.005	.001	74355	Ibuprofen	0.000		.005	.001
74362	Indomethacin	0.000		.050	.038	74359	Ketoprofen	0.000		.010	.003
80368	Meclofenamic acid	0.000		.010	.003	80342	Methyl Triclosan	0.000		.010	.003
80344	N,N-diethyl-m-toluamide (DEET)	0.000		.005	.001	74358	Naproxen	0.000		.005	.001
74353	Salicylic acid	0.000		.025	.006	80275	Tolfenamic acid	0.000		.005	.001
80341	Triclosan	0.000		.025	.006						

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 6-May-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MMMS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

If there are any questions or concerns regarding this report, please contact the person indicated above.
Please check the mailing information and inform the lab if changes are required. page 1 of 1

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1046

Contact: MMWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Site 5 Marquis
Matrix : 9
SmpDate: 20-Apr-09 @ 0845 Samplers..ID1 :
EndDate: @ 30-APR-200 ..ID2 :

Neutral Drug Residues
METHOD: 1883 | TimeLines (days)
SCAN: DRUGN | from sample date
| Max Actual
Date Received : 22-Apr-09 by: SS - 2 —
Date Extracted: 30-Apr-09 by: kls 10 10 ok
Date Analyzed : 30-Apr-09 by: kls 50 10 ok
Raw DataFile : D1046

VMV_CODE	COMPOUND NAME	ppb	flag	MDL	+\-	VMV_CODE	COMPOUND NAME	ppb	flag	MDL	+\-
80271	Acetaminophen	0.000		.05		106163	Benzoylecgonine	0.000		.01	
80293	Chloramphenicol	0.000		.01		80283	Ciprofloxacin	0.000		.02	
80294	Clindamycin	0.000		.01		106272	Codeine	0.000		.05	
80280	Cotinine	0.000		.01		80284	Enrofloxacin	0.000		.02	
80295	Erythromycin	0.000		.01		80285	Fluoxetine	0.000		.01	
80270	Lincomycin	0.000		.05		80282	Methamphetamine	0.000		.02	
80286	Norfloxacin	0.000		.02		80287	Norfluoxetine	0.000		.02	
80288	Ofloxacin	0.000		.02		80289	Oxolinic Acid	0.000		.01	
80290	Pentoxifylline	0.000		.50		80291	Pipemidic Acid	0.000		.50	
107265	Sulfabenzamide	0.000		.05		107266	Sulfadimethoxine	0.000		.05	
107267	Sulfadoxine	0.000		.05		107268	Sulfamerazine	0.000		.05	
106270	Sulfamethazine	0.000		.05		106271	Sulfamethoxazole	0.000		.05	
107269	Sulfapyridine	0.000		.05		107270	Sulfaquinoxaline	0.000		.05	
107271	Sulfathiazole	0.000		.05		80292	Trimethoprim	0.000		.02	

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 13-May-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MMWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

If there are any questions or concerns regarding this report, please contact the person indicated above.
Please check the mailing information and inform the lab if changes are required. page 1 of 1

ALBERTA RESEARCH COUNCIL — ORGANICS ANALYSIS DATA SHEET — ARC SAMPLE NUMBER: T09-1047

Contact: MWWS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Site 7 Raw Water
Matrix : 9
SmpDate: 21-Apr-09 @ 0718 Samplers..ID1 :
EndDate: @ ..ID2 :

Acidic Drug Residues
METHOD: 1883
SCAN: DRUGA

TimeLines (days)		
from sample date	Max	Actual
Date Received : 22-Apr-09 by: SS	-	1 —
Date Extracted: 28-Apr-09 by: ARJ	10	7 ok
Date Analyzed : 2-May-09 by: ARJ	20	11 ok
Raw DataFile : D1047		

VMV_CODE	COMPOUND NAME	ug/g	flag	MDL	+\-
80343	3,4,4-Trichlorocarbanilide	0.000		.025	.006
74361	Bezafibrate	0.000		.100	.015
74363	Carbamazepine	0.000		.010	.003
74360	Diclofenac	0.000		.010	.003
74356	Gemfibrozil	0.000		.005	.001
74362	Indomethacin	0.000		.050	.038
80368	Meclofenamic acid	0.000		.010	.003
80344	N,N-diethyl-m-toluamide (DEET)	0.000		.005	.001
74353	Salicylic acid	0.000		.025	.006
80341	Triclosan	0.000		.025	.006
74352	Acetylsalicylic acid	0.000		.010	.003
97939	Caffeine	0.000		.020	.001
74354	Clofibric acid	0.000		.010	.003
74357	Fenoprofen	0.000		.005	.001
74355	Ibuprofen	0.000		.005	.001
74359	Ketoprofen	0.000		.010	.003
80342	Methyl Triclosan	0.000		.010	.003
74358	Naproxen	0.000		.005	.001
80275	Tolfenamic acid	0.000		.005	.001

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 6-May-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MWWS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

If there are any questions or concerns regarding this report, please contact the person indicated above.
Please check the mailing information and inform the lab if changes are required. page 1 of 1

ALBERTA RESEARCH COUNCIL | ORGANICS ANALYSIS DATA SHEET | ARC SAMPLE NUMBER: T09-1048

Contact: MMMS Buffalo Pound Water Treatment Plant
SmpNo : ProjNo : GrpSmpNo :
StaNo : SK05JG0017 StaType:
Comment: Site 7 Raw Water
Matrix : 9
SmpDate: 21-Apr-09 @ 0718 Samplers..ID1 :
EndDate: @ 30-APR-200 ..ID2 :

Neutral Drug Residues
METHOD: 1883 | SCAN: DRUGN |

TimeLines (days) from sample date	Max	Actual
Date Received : 22-Apr-09 by: SS	-	1 —
Date Extracted: 30-Apr-09 by: kls	10	9 ok
Date Analyzed : 30-Apr-09 by: kls	50	9 ok

Raw DataFile : D1048

VMV_CODE	COMPOUND NAME	ppb	flag	MDL	+\-
80271	Acetaminophen	0.000		.05	
80293	Chloramphenicol	0.000		.01	
80294	Clindamycin	0.000		.01	
80280	Cotinine	.010	H	.01	
80295	Erythromycin	0.000		.01	
80270	Lincomycin	0.000		.05	
80286	Norfloxacin	0.000		.02	
80288	Ofloxacin	0.000		.02	
80290	Pentoxifylline	0.000		.50	
107265	Sulfabenzamide	0.000		.05	
107267	Sulfadoxine	0.000		.05	
106270	Sulfamethazine	0.000		.05	
107269	Sulfapyridine	0.000		.05	
107271	Sulfathiazole	0.000		.05	

VMV_CODE	COMPOUND NAME	ppb	flag	MDL	+\-
106163	Benzoylecgonine	0.000		.01	
80283	Ciprofloxacin	0.000		.02	
106272	Codeine	0.000		.05	
80284	Enrofloxacin	0.000		.02	
80285	Fluoxetine	0.000		.01	
80282	Methamphetamine	0.000		.02	
80287	Norfluoxetine	0.000		.02	
80289	Oxolinic Acid	0.000		.01	
80291	Pipemidic Acid	0.000		.50	
107266	Sulfadimethoxine	0.000		.05	
107268	Sulfamerazine	0.000		.05	
106271	Sulfamethoxazole	0.000		.05	
107270	Sulfaquinoxaline	0.000		.05	
80292	Trimethoprim	0.000		.02	

Zero (0) values indicate that the analyte is not DETECTED. MDL - Method Detection Limit

flags B - This analyte is found in the blank as well as the sample. The blank value has been subtracted.
X - Estimated value. The target compound meets the identification criteria, but is less than the MDL.
H - Compound Detected Q - Qualifying ions present but failed the ion ratio limits.
M - This value is calculated by an alternate Raw DataFile.

* - asterik following the value for Actual days taken indicates the prescribed time for that event was exceeded.

** - the Date Sampled is unknown, therefore timeline calculations can not be performed.

Certified For: Yogesh Kumar
Date: 13-May-09
Contact Person: Grant Prill

BUSINESS UNIT MANAGER
ANALYTICAL CHEMISTRY
ALBERTA RESEARCH COUNCIL
BAG 4000, VEGREVILLE, ALBERTA
T9C 1T4 (780) 632-8455

mail to: MMMS Buffalo Pound Water Treatment Plant
attn: Dan Conrad
Box 1790
Regina, Sk S4P 3C8

If there are any questions or concerns regarding this report, please contact the person indicated above.
Please check the mailing information and inform the lab if changes are required. page 1 of 1

Financial Statements - 2009

BUFFALO POUND WATER ADMINISTRATION BOARD
DECEMBER 31, 2009

Deloitte

Deloitte & Touche LLP
900 - 2103 11th Ave
Bank of Montreal Building
Regina SK S4P 3Z8
Canada

Tel: 306-565-5200
Fax: 306-757-4753
www.deloitte.ca

Auditors' Report

To The Chairman and Members of the
Buffalo Pound Water Administration Board

We have audited the statement of financial position of the **Buffalo Pound Water Administration Board** (the "Board") as at December 31, 2009 and the statements of operations, reserve for replacement of capital assets, change in net financial assets (liabilities) and cash flows for the year then ended. These financial statements are the responsibility of the Board's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by the Board's management, as well as evaluating the overall financial statement presentation.

In our opinion, these financial statements present fairly, in all material respects, the financial position of the Board as at December 31, 2009, and the results of its operations and its cash flows for the year then ended in accordance with Canadian generally accepted accounting principles.

Deloitte & Touche LLP

Chartered Accountants

Regina, Saskatchewan
March 19, 2010

Buffalo Pound Water Administration Board

STATEMENT OF FINANCIAL POSITION

[in dollars]

As at December 31

	2009	2008 Restated - Note 11
FINANCIAL ASSETS		
Cash	**3,069,455**	1,269,806
Accounts receivable		
City of Regina	**571,422**	486,410
City of Moose Jaw	**110,790**	207,022
Other	**106,742**	138,685
Total financial assets	**3,858,409**	2,101,923
FINANCIAL LIABILITIES		
Accounts payable and accrued liabilities	**275,037**	246,048
20% Refundable rate (Note 2)		
City of Regina	**1,860,986**	902,477
City of Moose Jaw	**343,990**	324,715
Surplus refundable (Note 1)		
City of Regina	**952,291**	403,647
City of Moose Jaw	**119,375**	96,101
Employee benefit obligations (Note 5)	**389,632**	310,325
Total financial liabilities	**3,941,311**	2,283,313
Net financial (liabilities)	**(82,902)**	(181,390)
NON-FINANCIAL ASSETS		
Inventory of chemicals	**175,996**	96,433
Prepaid expenses	**6,436**	2,668
Tangible capital assets (Note 6)	**28,279,286**	29,362,616
Accumulated surplus (Note 8)	**28,378,816**	29,280,327

See accompanying notes.

SIGNED ON BEHALF OF THE BOARD

Board Member

Board Member

Buffalo Pound Water Administration Board

STATEMENT OF OPERATIONS

[in dollars]

For the year ended December 31

	Budget (unaudited)	2009	2008 Restated - Note 11
REVENUES			
General water rate charges			
City of Regina operating contributions	5,434,240	**5,348,085**	4,959,913
City of Moose Jaw operating contributions	1,183,888	**1,163,744**	1,180,531
City of Regina capital contributions	543,424	**534,808**	495,991
City of Moose Jaw capital contributions	118,389	**116,374**	118,053
	7,279,941	**7,163,011**	6,754,488
Refundable water rate	1,323,626	**1,302,500**	1,227,192
Power charges	246,456	**227,718**	232,656
Miscellaneous water sales	92,543	**82,431**	59,348
Interest	24,197	**17,420**	61,554
Other	7,500	**5,052**	5,187
	8,974,263	**8,798,132**	8,340,425
EXPENSES (Schedule 2)			
Employee wages & benefits	2,166,200	**2,249,890**	1,964,076
Amortization of tangible capital assets (Schedule 3)	1,767,769	**1,767,769**	1,742,558
Utilities	1,775,000	**1,602,762**	1,526,973
Chemicals	1,696,000	**1,208,420**	1,305,472
Refundable water rate	1,323,626	**1,302,500**	1,227,192
Equipment maintenance	748,000	**484,997**	652,872
Miscellaneous	225,000	**201,569**	208,689
Laboratory supplies & maintenance	163,000	**94,393**	166,760
Building & ground maintenance	181,300	**76,604**	145,102
Administration	35,000	**42,720**	34,525
	10,080,895	**9,031,624**	8,974,219
(Deficiency) of revenues over expenditures before refundable surplus	(1,106,632)	**(233,492)**	(633,794)
Surplus refundable from operations allocated as follows:			
City of Regina		**(548,644)**	(403,647)
City of Moose Jaw		**(119,375)**	(96,101)
Change in accumulated surplus		**(901,511)**	(1,133,542)
Accumulated surplus, as previously reported		**76,221,882**	75,612,866
Prior period adjustment (Note 11)		**(46,941,555)**	(45,198,997)
Accumulated surplus, beginning of year, as restated		**29,280,327**	30,413,869
Accumulated surplus, end of year		**28,378,816**	29,280,327

See accompanying notes.

Buffalo Pound Water Administration Board

STATEMENT OF RESERVE FOR REPLACEMENT OF CAPITAL ASSETS

[in dollars]

For the year ended December 31

	2009	2008
Balance, beginning of year	**228,036**	1,188,883
Contributions		
City of Regina capital contributions	**534,808**	495,991
City of Moose Jaw capital contributions	**116,374**	118,053
Interest earned - capital reserve share (Note 4)	**2,853**	9,650
Capital expenditures	**(392,909)**	(1,584,541)
Balance, end of year (Note 8)	**489,162**	228,036

See accompanying notes.

Buffalo Pound Water Administration Board

STATEMENT OF CHANGE IN NET FINANCIAL ASSETS (LIABILITIES)

[in dollars]

For the year ended December 31

	2009	2008 Restated - Note 11
Change in accumulated surplus	**(901,511)**	(1,133,542)
(Acquisition) of tangible capital assets	**(684,439)**	(1,584,541)
Amortization of tangible capital assets	**1,767,769**	1,742,558
Surplus of capital expenses over expenditures	**1,083,330**	158,017
(Acquisition) of inventory of chemicals	**(1,287,983)**	(1,326,185)
(Acquisition) of prepaid expense	**(6,436)**	(2,668)
Consumption of inventory of chemicals	**1,208,420**	1,305,472
Use of prepaid expenses	**2,668**	1,670
(Deficit) of expenses of other non-financial assets over expenditures	**(83,331)**	(21,711)
Increase (decrease) in net financial assets	**98,488**	(997,236)
NET FINANCIAL (LIABILITIES) ASSETS, BEGINNING OF YEAR	**(181,390)**	815,846
NET FINANCIAL (LIABILITIES), END OF YEAR	**(82,902)**	(181,390)

See accompanying notes to consolidated financial statements.

Buffalo Pound Water Administration Board

STATEMENT OF CASH FLOWS

[in dollars]

For the year ended December 31

	2009	2008 Restated - Note 11
OPERATING ACTIVITIES		
Change in accumulated surplus	**(901,511)**	(1,133,542)
Add back non-cash item		
Amortization of tangible capital assets	**1,767,769**	1,742,558
Net change in non-cash working capital balances		
Decrease in accounts receivable	**43,163**	31,454
Increase (decrease) in accounts payable and accrued liabilities	**28,989**	(426,775)
Increase in 20% refundable rate	**977,784**	29,599
Increase in surplus refundable	**571,918**	232,811
Increase in employee benefits obligations	**79,307**	14,678
(Increase) in inventory of chemicals and prepaid expenses	**(83,331)**	(21,711)
Cash provided by operating activities	**2,484,088**	469,072
CAPITAL ACTIVITIES		
Acquisition of tangible capital assets	**(684,439)**	(1,584,541)
Increase (decrease) in cash position	**1,799,649**	(1,115,469)
Cash, beginning of year	**1,269,806**	2,385,275
Cash, end of year	**3,069,455**	1,269,806

See accompanying notes.

Buffalo Pound Water Administration Board

NOTES TO THE FINANCIAL STATEMENTS

[in dollars]

For the year ended December 31, 2009

1. BASIS OF OPERATIONS

The Buffalo Pound Water Administration Board (the Board) has been formed under a 1951 agreement, amended in 1991, between the cities of Moose Jaw and Regina for the purpose of operating the water treatment facility at Buffalo Pound Lake to provide a water supply to the two cities at cost. Any surplus (deficit) in a particular fiscal year is distributed to (charged to) the cities according to their respective usage. The 2008 surplus was not distributed to the City of Regina until 2010.

2. SIGNIFICANT ACCOUNTING POLICIES

The financial statements of the Board are the representation of management and have been prepared in accordance with Canadian generally accepted public sector accounting principles for local governments as recommended by the Public Sector Accounting Board (PSAB) of the Canadian Institute of Chartered Accountants. Significant aspects of the accounting policies adopted by the Board are as follows:

Use of estimates

The preparation of financial statements in conformity with Canadian generally accepted accounting principles for the public sector requires management to make estimates and use assumptions that affect the reported amounts of assets and liabilities at the date of the financial statement and the reported amounts of revenue and expenses during the year. Actual results could differ from those estimates.

Employee benefit obligations

Employee benefit obligations relating to severance or retirement benefits are recognized to the extent that they are vested and could be taken in cash by an employee on termination.

Pension benefit obligations

The Board is one of the sponsors of a multi-employer defined benefit pension plan. The Board follows defined contribution accounting under which pension expense is limited to the Board's contributions to the plan. The Board's share of any unfunded pension obligations is not recognized as pension expense.

Inventory of chemicals

Inventory of chemicals are valued at the lower of net realizable value and average cost.

Capital contributions

The funding for capital assets is through one of two means, from the Reserve for Replacement of Capital Assets or through a separate funding agreement between the cities of Moose Jaw and Regina.

Article 3 of the 1991 agreement between the cities requires an additional contribution from each city equal to 10% of the general water rate for every mega litre of water sold. This contribution funds the Reserve for Replacement of Capital Assets from which capital assets may be funded. For major capital projects that the reserve is unable to fund, a separate agreement between the two cities may be struck in order to provide funding for the project. Contributions from the cities under Article 3 of the Agreement or through a separate agreement are shown as capital contributions for financial statement purposes.

Buffalo Pound Water Administration Board
NOTES TO THE FINANCIAL STATEMENTS
[in dollars]

For the year ended December 31, 2009

2. SIGNIFICANT ACCOUNTING POLICIES (Continued)

Operating contributions

Under the terms of the Agreement between the cities of Regina and Moose Jaw, each city pays the Board for water and electricity used based upon the following rates established by the Board:

	2009	2008
General water rate, per mega litre	**194.08**	177.98
Electricity rate, per kilowatt hour	**0.06846**	0.06370

These revenues are recognized as the water is delivered to the cities' water distribution systems. Other revenues are recognized when earned and measurable.

Refundable water rate

Under Article 5 of the 1991 agreement, the Board receives an additional 20% of the general water rate from the cities for every mega litre of water sold. At each fiscal year end, the proceeds of these payments are refunded in proportion to the cities' respective capital investment in the Buffalo Pound plant.

Financial instruments

The fair value of cash, accounts receivable, accounts payable and accrued liabilities, the 20% refundable rate and the surplus refundable approximates the carrying value given their short term nature.

Tangible capital assets

Tangible capital assets are recorded at cost which includes all amounts that are directly attributable to acquisition, construction, development or betterment of the asset. The cost, less residual value, of the tangible capital assets are amortized on a straight-line basis over their estimated useful lives as follows:

General	
Land improvements	20 years
Vehicles and Equipment	7 to 20 years
Office and Information Technology	5 to 10 years
Infrastructure	
Plants and facilities	5 to 40 years
Roads	25 years

Assets under construction are not amortized until the asset is available for productive use.

Tangible capital assets received as contributions are recorded at their fair value at the date of receipt and also are recorded as revenue.

Leases are classified as capital or operating leases. Leases which transfer substantially all of the benefits and risks incidental to ownership of property are accounted for as capital leases and recorded as tangible capital assets. All other leases are accounted for as operating leases and the related lease payments are charged to expenses as incurred.

Buffalo Pound Water Administration Board
NOTES TO THE FINANCIAL STATEMENTS
[in dollars]

For the year ended December 31, 2009

3. CHANGE IN ACCOUNTING POLICY

For the 2009 fiscal year the Board changed its accounting policy related to the treatment of tangible capital assets to comply with PSAB section 3150, Tangible Capital Assets. Tangible capital assets are capitalized at cost and amortized over their estimated useful lives. In prior years, tangible capital assets additions were expensed in the year of acquisition or construction. This change in accounting policy was accounted for retroactively and has resulted in an adjustment in the prior year to opening accumulated surplus. See note 11.

The Board also implemented PSAB section 1200, Financial Statement Presentation, which establishes general reporting principles and standards for the disclosure of information in government financial statements. This section also resulted in the presentation of a new statement, the Statement of Change in Net Financial Assets (Liabilities).

4. RESERVE FOR REPLACEMENT OF CAPITAL ASSETS

The Statement of Reserve for Replacement of Capital Assets shows allocated interest to the Reserve of 2,853 (9,650 in 2008). This represents the interest earnings for the year and is transferred in accordance with Article 3 of the Agreement. The interest is calculated by applying the prescribed rate, being prime less one and three-quarters percent, to the average monthly reserve balance to a maximum of the actual interest earned on the funds.

5. EMPLOYEE BENEFIT OBLIGATIONS

The unfunded employee benefit obligations accrued at year end are as follows:

	2009	2008
Vacation pay	**156,717**	121,183
Vested termination payments	**232,915**	189,142
	389,632	310,325

Based upon an agreement with the Communications, Energy and Paperworkers' Union, termination payments for union employees vest after 15 years of service or upon retiring at the age of 65 after 10 years of continuous service. The amount payable on termination after vesting is 20 hours pay for each completed year of service.

For out-of-scope employees the termination payments vest after 10 years of service. The amount payable on termination after vesting is the wages the employee would have been paid had the employee worked for a time equal to their unused sick days on termination date. The maximum termination payment to an out-of-scope employee is 78 days pay.

Buffalo Pound Water Administration Board is a member of the City of Regina Civic Employees' Superannuation and Benefit Plan (the Plan), which is overseen by its own Administrative Board. All eligible permanent and probation employees of the Board are members of the Plan. This multi-employer Plan provides defined retirement benefits and is integrated with the Canada Pension Plan (CPP). The Plan provides a lifetime monthly pension based on an employee's years of service and the average of the best three consecutive years of earnings. For 2009 employees contributed 9.42% (2008 - 8.85%) of their earnings below the CPP maximum and 13.96% (2008 - 13.11%) of earnings above the CPP maximum and the Board matches employee contributions.

An actuarial valuation of the Plan position is completed at least every three years. An actuarial valuation of the Plan using the projected benefit method on a going concern basis as of December 31, 2007 disclosed an unfunded liability of 43,622,000 on a going concern basis and solvency funding of 99.4%. Following the market decline of 2008, preliminary financial statement projections as at December 31, 2009 indicate the plan had a deficit (unfunded liability) of net assets available to pay accrued pension benefits of 207,251,000 (2008 - 251,733,000).

The Plan is a multi-employer defined benefit plan; therefore neither benefits nor contributions are segregated by employer. The percentage of active Plan members employed by the Board at year end was 0.7%. The Plan managers have been unable to determine the portion of any unfunded liability attributable to each employer.

Buffalo Pound Water Administration Board
NOTES TO THE FINANCIAL STATEMENTS
[in dollars]

For the year ended December 31, 2009

5. EMPLOYEE BENEFIT OBLIGATIONS (Continued)

Accordingly, no portion of the deficiency has been recognized as a liability or expense in the financial statements. The Plan has been accounted for using the method appropriate for defined contribution plans and, as such, the amount of pension expense is equal to the contributions required for the year. Pension costs of 190,159 (160,785 in 2008) based on employer contributions were expensed during 2009.

Buffalo Pound Water Administration Board is a member of the Regina Civic Employees' Long-term Disability Plan (the Disability Plan). A valuation of the Disability Plan as of December 31, 2007 using the projected benefit method resulted in a surplus of net assets available for benefits of 11,916,000. Preliminary financial statement projections as of December 31, 2009 indicate a surplus of net assets available for benefits of 11,735,000 (2008 - 9,531,000).

The Disability Plan is a multi-employer plan and consequently, identification of individual employer's assets is not available from the Disability Plan managers. Accordingly, no portion of the surplus has been recognized as an asset or expense reduction in the financial statements. Disability benefits are based on 65% of the member's salary and will be paid either throughout the duration of the disability, until the member elects voluntary early retirement, reaches age 65 or upon death, whichever occurs first. The Disability Plan has been accounted for using the method appropriate for defined contribution plans and, as such, the amount of benefit expense is equal to the contributions required for the year. Member contributions are made to the Plan at a rate of 1.04%, with the employer matching contributions. The board recorded disability premium costs for 2009 of 17,831 (15,754 in 2008).

Dental and Medical plans are also provided for most employees and are paid for by the Board.

6. TANGIBLE CAPITAL ASSETS

	NET BOOK VALUE	
	2009	2008 Restated
General		
Land improvements	**-**	-
Vehicles and equipment	**354,904**	361,257
Office and information technology	**8,897**	-
Infrastructure		
Plants and facilities	**27,798,866**	29,001,359
Roads	**-**	-
Assets under construction	**116,619**	-
	28,279,286	29,362,616

For additional information, see the Schedule of Tangible Capital Assets (Schedule 3). During the year there were no write-downs of assets (2008 - $nil). In addition, there were no assets contributed to the Board (2008 - $nil)

Buffalo Pound Water Administration Board
NOTES TO THE FINANCIAL STATEMENTS
[in dollars]

For the year ended December 31, 2009

7. CAPITAL INVESTMENT

The Capital Investment represents the contributions made by each of the cities under Article 3 of the 1991 agreement, as well as those made under separate agreement, which have been used for capital purposes. Each City's investment is proportionate to the amount contributed. For additional information, see Capital Investment (Schedule 1).

	2009			2008
	Regina	**Moose Jaw**	**Total**	Total
Balance - beginning of year	**55,452,349**	**20,851,822**	**76,304,171**	74,719,630
Additions funded by:				
Capital replacement reserve	**289,142**	**103,767**	**392,909**	1,584,541
Balance - end of year	**55,741,491**	**20,955,589**	**76,697,080**	76,304,171

8. ACCUMULATED SURPLUS

Accumulated surplus represents the equity (accumulated deficit) of an organization. In determining accumulated surplus revenues and expenditures are recognized as they are earned and incurred, according to generally accepted accounting principles established by PSAB of the Canadian Institute of Chartered Accountants (CICA).

	2009	2008 Restated
Investment in tangible capital assets	**28,279,286**	**29,362,616**
Reserve for replacement of capital assets	**489,162**	228,036
Employee benefit obligations (Note 5)	**(389,632)**	(310,325)
Accumulated surplus	**28,378,816**	29,280,327

9. RELATED PARTY TRANSACTIONS

Related party transactions, in accordance with the agreement between the cities, are disclosed separately in the financial statements and notes to the financial statements, except as follows:

Included in accounts payable and accrued liabilities is 68,658 (40,818 in 2008) payable to the City of Regina.

Included in administration expenditures is an administration fee paid to the City of Regina of 27,900 (25,200 in 2008).

Buffalo Pound Water Administration Board
NOTES TO THE FINANCIAL STATEMENTS
[in dollars]

For the year ended December 31, 2009

10. COMPARATIVE FIGURES

Certain 2008 figures have been reclassified to conform to the 2009 financial statement presentation.

11. PRIOR PERIOD ADJUSTMENTS

The Board has restated its financial statements to comply with the provisions of Section 3150 of the PSAB Handbook which requires governments to record and amortize their tangible capital assets on their financial statements. In addition, revenue from contributed assets and government grants and transfers relating to capital acquisitions have been included in income. These adjustments are as follows:

Adjustments to opening accumulated surplus

	2009	2008
Accumulated surplus, as previously reported	**76,221,882**	75,612,866
Reduction of tangible capital assets to net book value	**(46,941,555)**	(45,198,997)
Accumulated surplus, as restated	**29,280,327**	30,413,869

Adjustments to change in 2008 accumulated surplus

Change in fund balances, as previously reported	(975,525)
Add:	
Tangible capital asset purchases expensed	1,584,541
Less:	
Amortization expense	(1,742,558)
Change in accumulated surplus, as restated	(1,133,542)

Buffalo Pound Water Administration Board **Schedule 1**

CAPITAL INVESTMENT

[in dollars]

For the year ended December 31

	2009	2008
BALANCE - BEGINNING OF YEAR	**76,304,171**	74,719,630
ADDITIONS FINANCED BY RESERVE FOR REPLACEMENT OF CAPITAL ASSETS		
Maintenance facility	-	1,546,054
Raw water pipeline seals	-	(1,067)
Plant controls and supervisory control and data acquisition (SCADA)	-	(1,500)
Instrumentation drawings	**43,009**	38,054
72 KV switch	-	3,000
Washrooms and Lunchrooms	**246,313**	-
Filter Valve Replacement	**73,611**	-
General Lab Equipment	**29,976**	-
	392,909	1,584,541
BALANCE - END OF YEAR	**76,697,080**	76,304,171

DISTRIBUTION OF CAPITAL INVESTMENT		
City of Regina	**55,741,491**	55,452,349
City of Moose Jaw	**20,955,589**	20,851,822
	76,697,080	76,304,171

Buffalo Pound Water Administration Board **Schedule 2**

SCHEDULE OF EXPENDITURES

[in dollars]

For the year ended December 31

	Budget (unaudited)	2009	2008 Restated
EMPLOYEE WAGES & BENEFITS			
Wages - permanent employees	1,654,500	**1,710,114**	1,527,202
Employee benefits - permanent employees	332,400	**346,131**	299,620
Overtime wages - permanent employees	82,200	**76,525**	63,867
WCB premiums	26,000	**17,130**	17,114
Premium pay - permanent employees	8,000	**13,223**	12,399
Car allowance	6,000	**4,920**	5,498
Clothing & boot allowance	3,000	**2,540**	2,430
Wages - casual employees	54,100	**-**	19,819
Employee benefits - vacation, sick and termination	-	**79,307**	14,678
Employee benefits - casual employees	-	**-**	1,276
Overtime pay - casual employees	-	**-**	173
	2,166,200	**2,249,890**	1,964,076
UTILITIES			
Electricity	1,310,000	**1,195,425**	1,170,499
Natural gas	465,000	**407,337**	356,474
	1,775,000	**1,602,762**	1,526,973
CHEMICALS			
Alum	1,290,000	**845,605**	1,058,260
Granular activated carbon	131,000	**207,011**	119,058
Chlorine	175,000	**106,260**	116,920
Miscellaneous chemicals	100,000	**49,544**	11,234
	1,696,000	**1,208,420**	1,305,472
EQUIPMENT MAINTENANCE			
Filtration plant	329,700	**188,729**	237,792
Wastewater system	152,000	**106,964**	154,215
Regeneration plant	129,600	**98,760**	152,793
Pump station	55,000	**39,487**	37,380
Computer & communications	60,300	**30,027**	42,926
High power electrical	9,800	**12,267**	22,121
Pipeline	11,600	**8,763**	5,645
	748,000	**484,997**	652,872

Buffalo Pound Water Administration Board **Schedule 2**

SCHEDULE OF EXPENDITURES (CONTINUED)

[in dollars]

For the year ended December 31

	Budget (unaudited)	2009	2008 Restated
MISCELLANEOUS			
Insurance	70,000	**63,909**	66,469
General supplies	18,000	**35,425**	15,102
Telephone	18,000	**13,327**	16,251
Professional & membership fees	23,000	**20,372**	20,871
Travel & conventions	23,000	**18,578**	13,116
Maintenance - vehicles	35,000	**17,801**	32,515
Stationary & office supplies	18,000	**14,014**	29,374
Awards & gifts	-	**5,480**	2,238
Advertising	-	**5,095**	1,080
Education & training	15,000	**4,032**	5,963
Contracted services	5,000	**3,536**	5,268
Equipment general	-	**-**	442
	225,000	**201,569**	208,689
LABORATORY SUPPLIES & MAINTENANCE			
Laboratory supplies	65,000	**57,514**	65,795
Laboratory equipment	40,000	**25,874**	34,556
Contract analytical	8,000	**10,320**	9,000
Accreditation program and research	50,000	**685**	57,409
	163,000	**94,393**	166,760
BUILDING & GROUND MAINTENANCE			
Filtration plant	161,900	**53,516**	118,729
Regeneration plant	10,900	**12,441**	9,343
Lake pump station	8,500	**10,647**	17,030
	181,300	**76,604**	145,102
ADMINISTRATION			
City of Regina administration	26,000	**27,900**	25,200
Audit services	9,000	**14,820**	9,325
	35,000	**42,720**	34,525

Buffalo Pound Water Administration Board **Schedule 3**

SCHEDULE OF TANGIBLE CAPITAL ASSETS

[in dollars]

For the year ended December 31

	General			Infrastructure				
	Land Improvements	Vehicles and Equipment	Office and Information Technology	Plants and Facilities	Roads	Assets Under Construction	2009	2008
Cost								
Beginning of year	11,373	1,134,564	13,468	76,172,575	2,321	-	**77,334,301**	75,749,760
Add:								
Additions during year	-	44,088	9,365	514,367		116,619	**684,439**	1,584,541
Less:								
Disposals during year	-	254,058	-	12,272	-	-	**266,330**	-
End of year	11,373	924,594	22,833	76,674,670	2,321	116,619	**77,752,410**	77,334,301
Accumulated amortization								
Beginning of year	11,373	773,307	13,468	47,171,216	2,321	-	**47,971,685**	46,229,127
Add:								
Amortization	-	50,441	468	1,716,860	-	-	**1,767,769**	1,742,558
Less:								
Accumulated amortization on disposals	-	254,058	-	12,272	-	-	**266,330**	-
End of year	11,373	569,690	13,936	48,875,804	2,321	-	**49,473,124**	47,971,685
Net Book Value	**-**	**354,904**	**8,897**	**27,798,866**	**-**	**116,619**	**28,279,286**	29,362,616